FARMERS DIGEST

25¢

Contents for May 1953

High Corn Yields	The Farmer	1
Turkey Outlook Improves*	Washington Extension Service	3
Crack Down on Dwarf Cattle?	Farm Journal	4
Chernoff's Cow Cafeteria	Electricity On The Farm	7
It Pays $30 an Hour	Capper's Farmer	10
Protect Your Hay From Spittle Bugs	Eastern States Cooperator	13
Bulk Feed Delivery Pays	New Jersey Farm and Garden	16
Farm Budget Bothers	Better Crops With Plant Food	19
Report on Fertilization of Pastures	The Shorthorn World	25
Ike's Own Farm	Breeder's Gazette	27
New Methods of Orchard Pest Control	American Fruit Grower	30
Creep Feeding Is Profitable*	Successful Farming	32
Once Over—And Ready to Plant Corn	Successful Farming	33
Keep 'Em Healthy, Look Out for Lead Paint	The Hereford Journal	37
Grass Silage and Self-Feeding Silos	The Ohio Farmer	39
Latest Remedies, Ketosis in Dairy Cattle	Rural New Yorker	43
1953 Wheat Outlook*	University of Wyoming	45
Hog Lot Bandits	The Southern Planter	46
Feed Situation More Favorable*	Farm and Ranch News	48
Lambs Are Saved During Pregnancy	Sheep Breeder	49
How FFA Sparked a Farm's Modernization	Electricity On The Farm	51
Lambs Pay More on Early Markets*	Ohio Extension Service	53
Is Your Lease a Good One?	Nebraska Farmer	54
Nitrogen on Corn, It Pays	Ohio Farm and Home Research	59
Prevention of Bloat in Dairy Cattle	Guernsey Breeder's Journal	62
Steer Profit in 'Finishing'*	Michigan State College	66
Apply Nitrogen to Produce More Protein	Missouri Ruralist	67
Milk Price Drop Came in Time*	Ohio State University	69
The 17-Year Locust	Pennsylvania Farmer	70
Make Mine Piper Sudan Grass	The Michigan Farmer	73
Range Those Pullets!	Poultry Tribune	76
Support Prices for 1953 Corn*	U.S.D.A.	78
Best Yet for Beef	Farm Journal	79
Fescue in Rows—Clover in Middles	Soil Conservation	81
Farm Land Prices Reach New Peak*	University of Minnesota	82
Grass-Eating Livestock and Poultry	New England Homestead	83
Land Ownership in Iran	Foreign Agriculture	86
Is Farm Parity Obsolete?	The Wall Street Journal	90

* Short Features — a few of the many in this issue. Index, pages 95-96

The Farmer's Digest

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Pasture Production and Management—By R. H. Lush, M.S., Professor of Dairying; Dairy Husbandman. Published 1952. Blakiston. Tells how to intensively cultivate, irrigate and manage pastures, so that the producers of any sort of livestock, from chickens to beef cattle, can secure intensive feeding of a large number of animals on a small pasture area $3.75

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The Farmers Digest

Volume 17 May 1953 Number 1

HIGH CORN YIELDS

Here's what happened when farmers asked their university to write a fertilizer prescription for 100 bushels per acre . . .

Condensed from The Farmer

THE records are in, and every one who joined the Corn Adventurers club in Wisconsin last year is happy—and surprised. Surprise results from the fact that average of yields in the 173 fields planted by the 162 farmers who took part in the adventure was 124 bushels per acre! Top yield was 160 bushels per acre, produced by D. Fitzsimmons of Iowa County.

The club was organized when agricultural extension workers asked Dr. Emil Truog and others in the University's Soil Department whether they could write a fertilizer prescription for producing 100 bushels per acre. With the department's newly developed nitrogen test, and with their tests for other plant food constituents of soil. "Send us soils samples," was the gist of their response, "and we will test them. Then we will tell the grower how much nitrogen, phosphate and potash he'll need to apply to produce a hundred bushels of corn per acre."

Of course the prescriptions were as varied as the soil samples sent to the state's laboratory at the University. The amount and analysis of fertilizer prescribed was dependent upon the analysis of the soil and upon how much manure the grower was going to apply. In the case of Fitzsimmons, for example, it was his intention to put on 10 tons of manure per acre. With that the

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St. Paul, Minnesota

prescription called for 141 pounds of actual nitrogen, 78 of phosphate, and 78 of potash. Fitzsimmons actually applied eight tons of manure, 97 pounds of nitrogen, and 90 each of phosphate and potash. The commercial fertilizer application thus was the equivalent of about 900 pounds of 10-10-10.

Along with heavy fertilization had to go a large per acre number of plants. On the Fitzsimmons field there were 17,130 plants per acre, which is more than twice the normal planting rate. At that rate a bushel of large flat kernels will plant only a little more than three and a half acres. On the Fitzsimmons place the corn was planted in rows 40 inches apart with kernels nine inches apart in the rows.

Two questions arise in connection with the Corn Adventure in Wisconsin just as they are certain to arise in connection with the X-Tra Yield Corn Contest in Minnesota this year. (1) Why, if the prescription was for 100 bushels per acre did the average yield run so much higher? (2) Does this all-out effort at producing a big yield pay costs and make a profit?

The first question is answered by the fact that the 1952 planting cultivating and growing periods were ideal for top corn production. The second question is answered only by studying some figures presented recently to a corn growers audience at the University of Wisconsin. Dr. K. C. Berger of the University of Wisconsin soil department started his discussion by saying that 200 bushel yields are feasible, if.... And the "ifs" are . . .

If it is a silt loam soil having good aeration or tilth and moisture holding ability. And, if it is fertilized to the degree soil tests indicate it should be fertilized, and if the plant population is high enough.

To get a 200-bushel potential, he figured, there should be from 18,000 and 21,000 plants per acre. 'This means drilling or hill dropping one kernel of corn every 7 or 8 inches or 2 kernels every 14 to 16 inches in rows 40 inches apart," he said.

Taking a typically good silt loam soil, Berger figured that in addition to 15 tons of manure per acre, fertilizer application would have to be 1,300 pounds of 10-10-10, 400 pounds of 4-16-16, and 250 pounds of ammonium nitrate per acre. Total cost of commercial fertilizer, he figured at $69.51 per acre. He gave the manure a value of $3 per ton so the value of the 15 tons of manure necessary would be $45, or a grand total of fertilizer of $114.51.

He compared this with the fertilizer investment necessary for a 75 bushel yield on the same soil.

Such a yield would require only eight tons of manure valued at $24.

On the highly fertilized field, total costs for seed, cultivation, harvest and other expenses ran to $169.51. On the other, $73.89. For the former investment there was a gross return, figuring the corn at $1.60 per bushel, of $320 per acre, and a net return of $150.49. On the 75 bushel field there would be a gross return of $120, and a net return of $46.11.

But what happens to these highly fertilized fields in drouth years. Said Dr. Berger:

"Fertilizer yields the greatest returns in drouthy years."

He cited the 1952 experiences of farmers in Missouri, growing corn in the Missouri Farmers Association corn growing contest. In one area there was only an inch of rain between planting and earing. In July the fields looked like they had taken a terrific beating. But at picking time the story was different. One farmer's fertilized field made 138 bushels on a plant food investment of about $23 per acre, while an unfertilized piece on his farm made only 49 bushels.

The big and profitable corn yields of the past year are stirring the imaginations of scientists and farmers alike.

Turkey Outlook Improves

Hatcheries supplying information on turkey operations reported 34 per cent fewer poults hatched during February than during February last year. If this is a good indication of the decrease in turkey production, prices can be expected to be above a year ago. The U.S.D.A.—Turkey Industry Advisory Committee has recommended that production of heavy birds be reduced 12-15 per cent below last year's record crop of 44.5 million birds.

January 1 intentions indicated that growers planned to raise eight per cent fewer turkeys than last year — three per cent fewer heavy breed. Such a reduction would likely mean slightly higher prices for light breeds and the same or slightly lower prices for the heavy birds.

Washington Extension Service

Hog Price Decline Likely

A small price decline in hog prices was expected this spring. Last fall's pig crop is now coming on the market, and slaughter is expected to pick up. Any price drop is expected to be small, however, and hogs should be on their way up again by early June.

Crack Down on Dwarfs?

New tool spots carriers of dwarfism in beef cattle. Can we afford to wait for something better? . . .

Condensed from Farm Journal

Paul Friggens

WESTERN cattlemen are wondering where they can buy purebred beef bulls that won't sire dwarfs.

Two hundred out of 300 range bulls consigned recently to sales in seven western states—checked out as dwarf carriers. They were detected by a new device — the profilometer.

The University of California has just examined more than 80 registered herds in several states. The report: In some herds, up to 25 per cent of the calves are dwarfs. Theoretically, that's the limit! One big bull owner spotted only eight clean bulls out of 73.

"In our investigations, we've found practically no major purebred herd completely free from dwarfism," flatly asserts Dr. R. T. Clark, national co-ordinator for beef cattle research, USDA.

"We're finding dwarfism in all sections of the country. Some herds that up to very recently appeared to be free are now reporting cases."

This calamity threatens to strike commercial cattlemen in full force.

"Dwarfism absolutely is on the increase in commercial cattle," Dr. Clark finds, "and if allowed to drift, it could be disastrous. Some stillbirths and early calf losses now appear to be associated with dwarfism."

A few desperate ranchers are resorting to cross-breeding, he adds, but this is no solution. *All major breeds are affected.*

"Unless we put out the fire, it is conceivable that we could lose 15 per cent of our calf crop, or

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Philadelphia, Pennsylvania

three million commercial calves a year!" So says Clark.

That's his size-up of the situation—one of the gravest problems ever to face the livestock industry.

Dwarfism is not new. For years, cattlemen have been seeing in their herds the occasional pug nose, the short and sometimes bowed legs, and the underslung bellies that betray dwarfs.

As early as five to ten years ago, a few alarmed breeders began dispersing herds, due, in part, to dwarfism. Today, purebred breeders of the fancy show types are hardest hit. We've been breeding for blocky, well fleshed, early maturing cattle. And somehow the dwarf gene is often tied up with these good qualities. But dwarfism is no respecter of types. It shows up in big, medium and small cattle.

The powder keg we're sitting on is the fact that purebred *carrier* bulls are being used in our commercial herds. Unless we do something, we'll have more and more heifers that are carriers. *When you mate a carrier cow to a carrier bull, one calf out of four is usually a true dwarf, and two more out of four will be carriers.*

Faced with this calamity, the industry wonders what to do. Only two experiment stations—California and Iowa—have definite dwarfism projects under way. So far, not a dime of United States research funds has been directly appropriated to fight dwarfism.

"Commercial cattlemen have no way to protect themselves," says Dr. Clark.

What's the answer?

"With a concerted effort," Dr. Clark asserts, "the industry can control dwarfism in two generations—say 10 years."

The first step is to spot the dwarf carrying bulls in our herds, and get rid of them. Dr. Clerk would tackle this with the instrument called a profilometer.

Dr. Paul W. Gregory, University of California scientist, developed it. Dwarf carriers almost always have a small bulge in the midforehead bones.

You can't see this bulge with the naked eye. But Dr. Gregory's device runs a profile from poll to tip of the muzzle. An expert, reading this profile, can spot the bulge almost every time.

Recently, Dr. Gregory checked profiles on 23 bulls—both carriers and noncarriers—and had them 100 per cent correct. On another mixed group of 33 bulls—some known to be carriers—he missed only one.

Experiment stations and the B.A.I. have used the profilometer on about 3,500 animals in seven states. They've checked hundreds of profiles back against breeding records, and so far the instrument has proved more than 90 per cent

accurate.

However, no one claims that the profilometer is the final answer. Frankly some breeders and even college people are dubious. They point out that whereas it practically always spots the carriers, it may also send some good noncarriers to slaughter.

"But it's the best tool we have," says Dr. Clark. "With demonstrated 90 per cent accuracy on mature bulls, it merits industry-wide use. We tackled Bang's and TB with tests less accurate than these."

Now, Dr. Clark and Dr. Carl B. Roubicek, regional co-ordinator of beef cattle research for the B.A.I., want to use the profilometer in an all-out attack on dwarfism. They are confident that "the profilometer will beat down dwarfism to insignificance," and that even if it costs a few innocent bulls it's worth the price.

Here's Their Program:

1. Set up profilometer teams in the cattle states, so that purebred breeders can request and get fast, accurate information on a *strictly confidential* basis. That way we could stem dwarfism, and protect the commercial cattleman who doesn't know what he's buying.

Already California, Washington, Wyoming and Oregon are using the profilometer on test, although they are not yet ready to serve ranchers. Livestock extension people are learning to use the instrument, and asking Dr. Gregory to read the profiles.

2. Set up a nation-wide research program. This is going to cost real money, which neither the state experiment stations nor B.A.I. now have. Something for your commercial livestock associations and the entire industry to back up!

About the need for research, Dr. Clark has this to say:

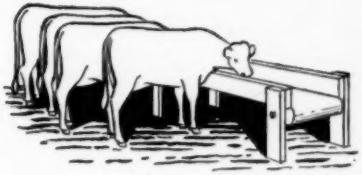
"We need to use the profilometer more extensively on younger animals — eight months or less. We need to know more about how dwarfism is inherited. We need to discover other ways to detect it — possibly through X-rays, blood tests, and other physiological methods." (Some scientists think that these may eventually yield the real answer.)

"Meanwhile, we have our first fighting tool in the profilometer. Some breeders talk test herds for proving bulls, like D.H.I.A. does for dairy sires. But a bull must be mated to not less than 13 proven carrier cows before we can be sure he's absolutely free of dwarfism."

Can the industry afford to wait?

Chernoff's Cow Cafeteria

A silo unloader and conveyor feed the silage, cows help selves to hay, then go to parlor for milking . . .



Condensed from Electricity On The Farm

William Gilman

HOW much time do you spend forking and toting feed to your cows, moving bedding in and manure out, trundling back and forth to the milk room? Too much? Then let's visit David Chernoff's new pushbutton barn layout to see the ways he has licked chore problems.

Actually, so many other "York State" farmers have been driving over to Chernoff's place at Sangerfield, Oneida County, that he's been kept pretty busy just showing them around. It's been going on ever since he rebuilt after his old labor hog of a barn burned down in the summer of '51. But being human, he's proud to show the place, and time is certainly easy to spare. Even when the hired man was away, Chernoff could run two dozen cows through his homemade milking parlor in 45 minutes. With more milkers now, two men handle 51 in 75 minutes.

"Total chore time is less than a third what it was," Chernoff figures, "and about half what it would be if I'd rebuilt with a conventional barn equipped with labor savers like gutter cleaner and silage unloader."

His construction costs were also way down. Pole type construction is cheap and that's what he used. The buildings, a total of three, form a large "U." There is a 52 by 104 foot "bedroom" on one side, and a 44 by 117 foot "cafeteria" on the other. A conventional 26 by 50 foot production building, which houses the milking parlor, closes the end of the "U."

"I've found frills don't produce more milk," says Chernoff. "What is needed is weather protection for the herd, bedding, and feed —

Reprinted by permission from Electricity On The Farm
New York City

and that's what I've got under 24 gauge galvanized roofing."

Using home grown timber saved $2,000. Hemlock poles, off the place, were buried four and one-half feet deep and received groundline preservative treatment costing 40 cents a pole. The milking parlor that does away with such things as stanchions and gutter cleaner was another big money saver. Inside the U is a 50 by 104 foot exercise yard.

When Chernoff was considering a mechanized, conventional barn big enough to hold the 72 milkers he can now handle, the cost made him shudder. Estimates ran around $40,000. The setup he built and equipped ran way under half that.

Actual money paid out was $15,300, including such things as buildings, milking machines, cooler, milk pipeline, silage unloader and furnace. Only thing not included is the silage self-feeding bunk, which would add around $700 cost — $100 for the motor furnished as a demonstrator; $300 for the conveyor belt furnished on a one year trial basis; the rest for switching controls, etc. Another $1,000 — making a grand total of around $17,000—can be figured for concrete paving the feeding alley and exercise yard to insure them against becoming muddy during wet seasons.

The thing that hits visitors' eyes first is the feeder barn. Cows entering from the yard line up along a 15 foot wide alley to eat silage off a 106 foot long conveyor. This runs down along the wall from the 16 by 48 foot corn filled cement silo which contains an automatic unloader run by a three horsepower motor. The switch for the unloader motor starts the synchronized conveyor and silage drops onto the belt from a silo chute.

This conveyor is a rubber belt type adapted from a gutter cleaner. It is pulled by a quarter inch steel cable operated by a one horsepower motor at the far end. In 12 minutes, cows can feed anywhere off the entire belt. Its motor is reversible which allows self-cleaning. A rubber covered nylon cable takes the belt back under the conveyor platform after the cows are fed.

From this all-electric cafeteria, cows get silage. For hay, they simply turn around in the aisle and get it directly through side openings into two hay mows. Except for alleys and the two foot wide conveyor, the entire building is hay space from the ground up. Chernoff simply rolls bales down to cows and opens them.

At milking time, cows move along, tandem fashion, up four concrete steps into the 12 by 50 foot parlor. Eight of them stand, four on each side of a 30 inch deep concrete pit that eliminates stooping. After milking, they exit

at the rear.

Chernoff figures he saved $1,000 by using old one and a quarter inch pipe and building his own chute type stalls with gates, front and rear, that let cows pass straight through. The drop gates are operated from the pit. So are the grain buckets—converted foot washtubs—which swing into the stalls. There's a 3,000 bushel granary overhead and each cow gets her ration through a three and one-half inch galvanized chute pipe with a homemade self-measuring gauge at its lower end.

Milk is moved combine method through a pyrex glass pipeline directly into cans in the milk room. There they slide into a side loading cooler that Chernoff has become mighty fond of—no more can hoisting, no more soaked clothes. And with pipeline milking washup chores are easier.

Between the steps up into the parlor there was room for a thermostat controlled oil burning furnace. This provides heat for the milking parlor and adjoining 14 by 17 foot milk room. It also sends warm air through ducts to the rear of the building where Chernoff has his bull and maternity pens.

"I've heard some veterinarians who criticized pen stabling," he says, "because they had to waste so much time catching animals. This way, I can have a tied up cow waiting for the vet."

Straw bedding for the pen stable is handy and along the north wall for winter insulation. Chernoff throws out a fresh layer every day. Bedding and manure accumulate for a cleanout once a year, with his tractor's manure loader doing the labor.

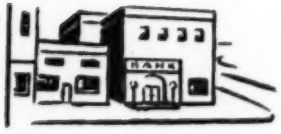
The other cleaning is tractorized, too. In the exercise yard, manure is pushed out every few days, depending on weather. In the feeder barn, drive-through doors allow the tractor scoop to push manure out daily into the waiting spreader. And this spreader also distributes fresh sawdust.

After the fire, Chernoff's county agent hesitated on what to recommend. He preferred a conventional barn, but added, "I can't see you going in debt for a $40,000 barn."

So they went to the state fair, saw the pen type exhibit there. Chernoff commented, "Not bad, eh?" and the agent nodded, "No, not bad."

Chernoff did a lot of scouting for other practical ideas he might incorporate, and took the plunge, hoping all the pushbutton methods would work out. Now, he says, "I should have done it long ago."

Even his electric bill turned out to be a pleasant surprise. It runs, at most, around $12 a month, and Chernoff asks, "How many hired men can you get for that?"



They let their bank help keep their books . . .

It Pays $30 an Hour

Condensed from Capper's Farmer

George A. Montgomery

KEEPING farm records isn't so hard. Mr. and Mrs. Lloyd Klotz do it in 30 hours a year, and it pays them 50 cents a minute—$30 an hour—for the time they spend.

When they began keeping records in Chickasaw county, Iowa, 10 years ago, as members of the Northeastern Farm Business Association, L. J. Bodensteiner, field supervisor, suggested that they switch to an inventory basis in computing income taxes.

Later, when they dispersed their high producing dairy herd, that change saved them $1,500 in one year. Selling the herd enabled them to get along without a hired hand, who was costing them $2,400 a year in wages, to say nothing of extras, such as milk, eggs, meat and a house to live in.

Big items like $1,500 and $2,400 made me wonder whether that $30 an hour was high enough. So I asked them about it.

They agreed that the value might be $40 an hour or even $60 an hour ($1 a minute) but they had no way to tell for sure. So they preferred to let it stand at $30. They were certain it was that high—and they would rather be too conservative than to be wrong.

They were basing their estimate on net income and they had no way to tell how much it had been affected by advancing farm costs and lower farm prices, and how much by the changes suggested by Bodensteiner.

Here's the way they cut down bookkeeping labor: Every time anything is sold off the farm the money is deposited in the bank. The cashier, C. E. Leach, or some other bank employee enters the amount on the Klotz bankbook. Preceding the figure is the item for which the money was received.

If Klotz deposited a check for swine he sold, Leach's entry might

Reprinted by permission from Capper's Farmer
Topeka, Kansas

read: "February 4—20 hogs, $836.48." Each entry stretches across the double page spread in the little book.

At the end of the year that little black bankbook contains every item of income for the 12-month period.

Every bill that is a legitimate income tax deduction is paid by check. At the left a notation is made to show items covered. One may be for tractor oil, another for machinery repairs. One to the druggist might be for $7.80 to cover some items that are deductible, others that aren't. At lower left might be a notation: "Vaccine, $5.10." That is a deductible farm expense.

So there is no remembering to do, no way to forget. About three times a year Mrs. Klotz sets aside a day for posting the books. She has the little black bankbook at hand, and all cancelled checks for the months that have elapsed since last bookkeeping day.

"Everything is there," Klotz said. "At the end of the year it is easy to fill out the income tax blanks. And you know they are right. You can be sure the internal revenue people aren't going to dig up some income you have forgotten."

When the Klotz family became members of the farm record association in 1941, they were operating the home farm of 116 acres. The principal project was dairying, and Klotz was working hard to further improve the Holstein herd his father had founded.

When he had a chance to buy the farm in 1944, he consulted Bodensteiner, who told him prospects were such that the purchase seemed advisable at the price and terms offered. Two years later he had a chance to add another 80. Again Bodensteiner assented and the land was bought.

But a 196-acre unit, with dairying the top project, called for a hired hand.

By 1948, the herd was up to 22, and Klotz had pushed production up to 500 pounds a cow. He was proud of that production record.

There was a second goal he wanted to reach. He had been in the top half in income among record keepers in his association. He wanted to climb into the top third. He asked for suggestions.

"You need a better balanced program," the fieldman told him. "Your herd records are extremely good, but it strikes me that, with only a butterfat market, the last 50 to 100 pounds of fat are costing you too much. Your best cows are getting 16 pounds of grain apiece. You might make more money if you gave them 8 pounds and fed the rest to hogs.

"A dairy cow is an efficient user of roughage. But if you feed her too much grain, she substitutes that for hay and silage, and the net profit goes down."

When Bodensteiner was gone, Mr. and Mrs. Klotz talked the matter over. They decided to cut the herd from 22 to 14, and feed no more than 8 pounds of grain daily a cow. There would be several gains from doing so.

They could raise 300 pigs or more a year, instead of half that many. Hogs would make up for loss in dairy income.

The change would give them more freedom. Handling cows that were averaging 500 pounds was a job that required great punctuality and good judgement. Klotz couldn't trust anybody else to do the feeding and milking. If cows went to a ration higher in roughage, it wouldn't be so easy to get them off feed. The hand could do the feeding and milking.

At the end of the first year on the new program, the record books showed Klotz had $181 of income for each $100 worth of feed fed. The year before it had been $161. Keeping books was the real way to learn what practices paid best.

Later, it was easy for him to see that he might be still better off if he sold the Holsteins and put all of the feed he raised into hogs and beef cattle. So the herd was closed out in December, 1950.

Farm record keeping does more for the Klotz family than can be counted in dollars and cents.

The matter of whether to remodel the house or pay off the debt against the land was another that Bodensteiner helped to decide.

"By all means, remodel," he told them. "Your children are entitled to a nice home while they are growing up, and can enjoy the benefits while you are earning the money to pay for it and to retire the mortgage on the farm."

"We value Bodensteiner's advice," Klotz told me. " He wants you to live well and enjoy life as you go along. We are inclined to be a bit conservative. Without his counsel we might cheat ourselves to get the land debt paid before buying the conveniences we can safely afford."

The farm mortgage, now down to $4,000, could have been retired if the Klotzes hadn't put up a new silo, laid a carload of tile to drain the farm, and rebuilt the house.

The silo and the tile will earn to retire the mortgage, and the house will pay dividends in satisfaction for the family.

The corn borer is believed to have arrived in this country in the early 1900's with a shipment of broomcorn from southern Europe. It was first discovered near Boston in 1917.

How to Protect Your Hay From Spittle Bugs

They can cut your first cutting yield up to 50 per cent . . .

Condensed from Eastern States Cooperator

J. O. Pepper

Extension Entomologist, Penn State College

THE meadow spittle bug and its varieties have become increasingly important as a hay crop pest. This insect injures the first cutting of hay and its damages are more severe on legumes, such as clover and alfalfa, than on grasses.

The presence of spittle bug is indicated by frothy, saliva-like masses of spittle on the stems and leaves of plants, especially in the growing crowns or terminals. Inside these frothy masses are small insects which suck the plant juices, passing most of the liquids through their digestive systems to produce the spittle masses. When the nymphal development is completed, they emerge as adults. The adults are light-to-almost-black, wedge-shaped insects about one-fourth inch long. They resemble large leafhoppers, but jump readily when disturbed. Thus, the common name of "frog-hopper" is sometimes given to the adult.

The spittle bug overwinters in the egg stage. The egg masses, consisting of two to 20 eggs, are glued on with froth behind the leaf sheaths of grain stubble, old pieces of corn stalks, weeds, and many other plants. The eggs hatch into small nymphs in the spring. In Pennsylvania this is late April to early May. The developing nymphs (young bugs) are always in a mass of spittle. The nymphs develop into adults from late June through early August. The adults may be seen in abundance on a large number of plants, but the writer has never been able to observe any injury being done by adults. The nymph stage is the one that causes severe plant injury. In Pennsylvania, only one generation of spittle bugs occurs each year.

Spittle bug injury may reduce yields of first-cutting legume hay

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Springfield, Massachusetts

from 15 to 50 per cent according to population of the insects. Demonstrations in Pennsylvania, over the past four years, have shown that spittle bug control increased the yield of first-cutting dry hay from 0.03 to 1.1 tons per acre or an average of 0.5 tons. In 1942, a demonstration was run which showed that one application of material on first-cutting of hay also increased the yield on second-cutting. The results were as follows:

First-Cutting Yield		
Treated	*Untreated*	*Increase*
3.53 T.	2.43 T.	1.10 T.

Second-Cutting Yield		
Treated	*Untreated*	*Increase*
1.37 T.	.28 T.	1.09 T.

The total yield of dry hay per acre from the two cuttings on the treated area was 4.90 tons versus 2.71 tons on the untreated or a difference in favor of the treated of 2.19 tons.

The injury caused to hay crop by spittle bugs is manifested in many ways. Some of these are: (1) Stunting and reduction of growth; (2) lowering the vitality of the plants, causing many to die; (3) requiring a longer drying time because of the spittle masses . . . in many cases musty or moldy hay is the result; (4) reducing hay quality by fewer and smaller leaves and proportionately more and tougher stems; and (5) reducing protein content of hay. In hay mixtures of legumes and grasses, the legumes are sometimes taken out entirely by injury from spittle bugs.

Materials Recommended for Spittle Bug Control

Insecticides	*Amount to use per acre*
Wettable Powders	
1. Benzene hexachloride (10-12% gamma isomer)	2 lbs.
2. Toxaphene, 40%	3 lbs.
Emulsion concentrates	
3. Benzene hexachloride (10% gamma isomer)	1 qt.
4. Toxaphene, 60% (6 lbs. per gallon)	1 qt.
5. Methoxychlor, 25% (2 lbs. per gallon)	2 qts.
Dusts	
6. Benzene hexachloride (1% gamma isomer)	30 lbs.
7. Toxaphene, 5%	30 lbs.

Equipment

1. High pressure sprayers with 200 to 400 pounds pressure, applying 50 to 100 gallons of spray per acre.

2. Weed type sprayers with capacity to apply 20 to 30 gallons of spray per acre at 40 to 80 pounds pressure. Weed sprayers that apply less than 20 gallons per acre are usually less effective.

3. Ground dusters, adjusted to deliver about 30 pounds per acre.

4. Airplane dust or spray applications. In high pressure sprayers, either the wettable powders or the emulsion concentrates may be used. *With weed type sprayers, use only the emulsion concentrates, since the wettable powders will clog the screens and nozzles of these sprayers.* The spray boom and nozzles should be adjusted so as to give even and complete coverage. With most spray booms, this means the nozzles should be about 20 inches above ground level. Dust should always be applied when there is little or no air movement.

Good stands of clover and alfalfa are more likely to show better profits from treatments than poor stands. New seedings of alfalfa and clover are usually more heavily infested with spittle bugs than older fields since the grain stubble is an ideal place for the adult spittle bug to lay eggs. Beginning about mid-April, legume hay fields should be carefully and frequently examined for spittle bug egg hatching. The tiny masses of spittle are easily seen. Treatment should be made promptly after spittle masses are found and the new growth of alfalfa should not be more than six inches high. Alfalfa should be used as a gauge for clover growth. If the growth is larger than mentioned, the insects are bigger and are protected by foliage, thus harder to kill. Furthermore, late treatments may present a residue problem on the hay.

Precautions

1. Do not use benzene hexachloride on hay crops where any edible root crops, will be planted in the next rotation. Use one of the other materials instead.

2. If weed-killing chemicals have been used in sprayer, be sure that tank, pump, boom, and nozzles are thoroughly cleaned before using to spray alfalfa or clover.

4. Avoid any chances of poison residue by making application before six inches of new growth occurs (using alfalfa as a guide).

5. Handle insecticides correctly. Keep them out of the way of livestock and out of reach of children and do not pollute streams with them.

Spittle bug control has proved to be practical and economical in increasing yields and quality of alfalfa and clover hay. Early spring treatment with an insecticide for spittle bug control on first-cutting of hay does not prevent leafhopper and other insect injuries on the later cuttings or crops.

Bulk Feed Delivery Pays!

It brings savings to both buyer and supplier . . .

Condensed from New Jersey Farm and Garden

Harlo Beals

A FARMING community with a feed service which can make deliveries to the farm in bulk is indeed fortunate. The savings in cash and work, on the farms, are such that large farm operators should seriously consider a bulk delivery service.

A bulk feed delivery system reduces hand work, both in the feed mill and on the farm. It eliminates the use and cost of a bag. It moves the feed from the mill or the car to the farm mechanically. All this looks very simple and easy, but to have an effective bulk delivery service, a large number of changes in handling methods, buildings, machinery and truck equipment must be made.

First, it takes an area that has in it a number of feeders who are large operators and who are willing to purchase their feeds in lots of not less than two or three tons of one kind of feed per delivery. It is impossible to make bulk deliveries efficiently when the order is for 500 pounds of mash, and 500 pounds of scratch grains, or 1,000 pounds of a dairy feed.

Second, the purchaser of the bulk feed must have a bulk bin which is so located that bulk feed can be put in with the bulk delivery equipment that is available in the community. This means that the road to the bin has to be good enough to carry the load any time of year. The bin should be designed so the feeder can draw or shovel the feed into a feed cart or mechanical feeder, easily and quickly.

Third, the feed dealer must have a bulk feed delivery truck if the purchaser does not have his own conveyance. These trucks vary all the way from the big tankers with their unloading systems to the use of the usual platform truck, equipped with a hoist

Reprinted by permission from New Jersey Farm and Garden
Sea Isle City, New Jersey

to assist in the unloading and a simple conveyor which is operated by an electric motor with the power furnished by the purchaser.

Fourth, the feed dealer must have the equipment to handle feed in bulk. This means some sort of bulk conveying system from the bulk carload to the bulk delivery truck, or a mixing system which delivers the mix into the bulk truck, rather than the bag.

All of this looks simple on paper, but becomes a complicated deal in actual operation. It means change. The purchaser has to provide the proper bin storage. This means changes in the location of the feed room, in the way the feed is handled at feeding time. It means expense varying from practically nothing to several thousand dollars, depending on the operation.

It means that the feed dealer may have to rebuild part of his plant. He has to purchase a new type of delivery system. This can run from a few hundred dollars for a simple conveyor to over $10,000 for a single bulk delivery truck.

Many people have one thing in common. They resist change. This applies to the bulk feed business. Some dealers will say there are no savings to be made. The feed will separate and throw production off. Some farmers will agree. They cannot see how they can make any saving. They have no place for a bulk bin and besides it won't run out. Wherever there is a large volume of feed used, these folks are apt to find themselves very much in the minority.

So far, what feed separation there is, when handled in bulk, does not interrupt production. Bins can be constructed so the flow will be reasonably free and easy. Feeding systems can be developed which will move a large volume of feed daily—and easily —from the bulk bin to the cow or hen.

Farmers ask what will be the saving in bulk delivery. This is a hard question to answer. To get at the answer, let us ask more questions:

1. How much is it worth to never have to lift a 100 pound bag of feed?
2. How much is it worth to be free from the handling of the empty bags?
3. How much is it worth to the feed dealer to send one man instead of two on a farm delivery?
4. How much is it worth to the feed dealer to handle a large percentage of his tonnage by pulling a switch, rather than dragging bags around?

These factors add up to dollars. No one has the right answer. Many have opinions. *Some say* there are no savings; others claim from $2 to $5 per ton. Probably the correct answer is somewhere

between these figures.

Under the right circumstances, it offers freedom from the routine drudgery of handling many tons of feed and grain. The challenge in many communities is to work out a bulk delivery system which meets the local situation. Such a challenge can test the imagination of the dairy and poultry men and their feed suppliers. This much is sure: There are savings and profits for both, if they will work together.

Use Wheat Straw As Substitute Roughage

Kansas State College scientists have dusted off some research results dating back 25 years to help out with the current shortage of roughage feed.

Object of their data hunt: To illustrate that wheat straw will do as roughage, if you supplement it right.

In wintering tests during 1926-'27, wheat straw and two pounds of cottonseed meal produced an average daily gain of 0.27 pound on yearling steers, and 0.54 pound on calves. The yearlings ate an average of 18 pounds of straw per day, and calves 10 pounds.

Present day straw probably won't do quite that well, say the Kansans. In those days, the straw probably contained some shrunken grain, and was of better quality.

If you're using wheat straw or other poor quality roughage, the Kansas specialists suggest that you also feed about one pound of alfalfa pellets per head per day. This will permit you to cut back protein concentrates to about one-half pound. —*Farm Journal*

Only Young Pigs Helped By Antibiotic Pellets

If young pigs are to benefit from antibiotic pellets they must be treated *before they're two weeks old,* reports John Lasley, University of Missouri scientist.

When Lasley implanted a thousand-unit Bacitracin (Bas-si-TRAY-sin) pellet behind the ears of two day old pigs, the pigs gained a pound more in four weeks than those that didn't get the treatment. They weighed two and a half pounds more at six weeks.

But—when the pellets were implanted in pigs two weeks old, there was no difference in weights, either at four weeks or at six weeks of age.

A total of 105 pigs got the pellet treatments. Lasley says that the Bacitracin pellets seem to help some pigs more than others. His tests will continue. —*Farm Journal*

Farm Budget Bothers

How to finance young farmers has become one of the gravest problems of our generation . . .

Condensed from Better Crops with Plant Food

Jeff McDermid

THAT old traditional "ladder" whereby the youngsters of other times in theory could advance upward rung by rung, from hired man to farm tenant and then to part and full ownership by dint of thrift and good management, is a broken reed and a myth. How to finance young farmers is probably one of the gravest questions facing our generation. Money to "make the mare go" in the days of oats and harness has become mere chicken feed against the expensive equipment now required to plow and harvest.

You have doubtless seen those startling figures that compared the investments and operating charges on general farms today with the situation that existed during World War I. There are other reports just as disquieting and challenging. The values and financial investments for good farms have been mounting since 1940.

These figures tell us flatly that the days are gone forever when the member of the family who had the least grit and gumption was assigned to take over the inherited acreage—leaving the city's big business opportunities for the children with the shrewdness and ambition.

A typical farm growing feed crops, hogs and beef cattle in the midwest could have been bought for $20,500 about 12 years ago, including the livestock, equipment and machinery. But a year ago the going value of this same type of farm stood at slightly under $70,000. Up in the northeast a typical dairy farm that cost only about $10,000 fully equipped in 1940 took $25,000 to buy in 1951. Down along the Piedmont in the

Reprinted by permission from Better Crops with Plant Foods
Washington, D. C.

cotton area a farm that cost $5,000 in 1940 called for an investment of $13,000 in 1951—and so it goes.

No doubt young farmers are not the only rural youth who grapple with the enormous budget it takes to acquire a farm. The businesses that cater to farm needs and supply, repair and service farm equipment have risen also in relative values. Prosperity and the high standards of living move in two directions it seems—toward a fuller and a more abundant life on the one hand and toward steeper capital needs and risks and more shrewd sense and technical skills on the other.

Some way must be found to sustain the keystone vocation of our national life so that the forthcoming generations of rural youth may be financed for production. The applause and prizes bestowed upon 4-H members and Future Farmers in their brief hours of triumph must not be a mockery when the time comes for them to settle down to notes and chattels and amortized mortgages.

In former times the fellow with small brains and good muscles and a liking for agriculture had as much chance to succeed in the furrow as the lad today who has good college training, good health and farming experience. Obviously the reason was that old-time farm operating tools were few and simple, a large part of the job was for family sustenance alone, and the tremendous new world of science and commercial competition had not hit the hinterlands. We have looked backward to those quiet times with natural nostalgia—and learned a lot thereby—yet nothing will be accomplished for a safe track ahead by looking out the rear door of the caboose. The job facing us now is to equip a skillful advance track-scanning crew to render wrecks less necessary.

There has been a continued trend toward fewer and larger farm units. Alongside it has come much greater capital invested per farm worker because of the consumer demand and the better equipment on farms. The high level of farm prices maintained both by the law of supply and demand and the artificial action of government is another factor. Many farmers who got hold of farms they now own in the early postwar years are now getting old and want to quit. But they are heavily capitalized with equipment and other non-real-estate assets, which must be acquired and allowed for in transfers to younger men. These younger chaps in their own turn will expand their investments in other gadgets and improvements, and the land values will probably rise also. The debt-free burden will be getting heavier instead of lighter, and with it the increasing need for the

ablest and keenest sort of farm management.

It's only the most brilliant and ablest "Star" farmers and 4-H winners who bring any great accumulated original capital to the buying of a farm. Typically the beginning farmer has only his devotion to agriculture, his earnest applied training, and a willingness to work hard. For this he seeks financial credit geared to his future needs. This is the place where the rural bank or other credit institution has to "go into a huddle" lest the signals be misunderstood.

Shall the tyro in tillage be granted a loan for the full purchase price of the farm's resources and equipment? Few there are who are very eager to take this leap into an unknown financial abyss—as both the lender and the borrower would be in a state of jitters while this thing lasted. Hence most beginners could not finance the outright purchase of a full-blown going farm. Neither could they adopt the old way of starting as a hired man with hopeful eyes to final ownership. Of course, farm wages are more than treble what they were some years ago, but the saving of them is just as hard to accomplish now. Moreover, to rely upon possible inheritance of a going farm is often a long-time proposition which may not come true at a time when the youngster is ready to make his start.

Fortunately there are some young men who have grown up in a good farming community and are accepted as tiptop moral risks in any reasonable purchase deal. Sometimes they can arrange to borrow some pieces of equipment and have notes endorsed readily for the rest. To swing a real estate deal comes hard enough but not so tough for these lads as for the majority who come into the game barehanded. Another limited number of competent and ambitious youth, many of them veterans, secured loans on easy terms from the Farmers Home Administration in cases where no other avenue of credit could be found. Here and there a few religious groups and other societies extend help in critical times for young borrowers who want to get farms.

But another dilemma bobs up too often. That's the difficulty of getting a line on any suitable farms. Young beginners must have land enough to make farming profitable, as well as the kind of land that won't require a heavy expenditure at once for fertility and conservation measures. Farms of large size, with considerable cultivated land as well as buildings and meadows to maintain properly, may also be far beyond the scope of the new recruit to handle.

Purchase agreements that can be fixed up between tired or re-

tired farm-owners on good land and a worthy young partner are becoming more popular as one other way to break the deadlock. The young man goes to this neighboring landowner with little but his own eagerness and skill to recommend him. Perhaps the owner has no boys himself to look to for transfer of his property. So he agrees to dicker with the daring of his new-found friend.

They agree on a base wage to begin with, a sum that seems fair to both as an assurance of good faith. What it figures to annually is their own business, depending on the type of farm and the ability of the youngster. Besides the basic wage the farm owner is willing to pass over a certain share of the gross or the net farm income to the beginner. This start in the form of a simple wage, as to a hired man, plus a share of the returns, as with a renter, gives both parties to the deal a working plan that could lead to partnerships and leases—provided the beginner is thrifty and salts down some of his share of the income. Naturally there are also some arrangements made on addition of new stock and equipment, all calling for consultation with authorities who know all the ins and outs of proper farm financing.

We know of several families with numerous children who tried out the well known father and son operating agreements with three or four of the sons in series. Each boy stayed long enough on the home farm agreement basis to accumulate enough capital and managerial experience to launch his enterprises in a regular lease and purchase deal or an outright purchase loan from a bank or a landowner elsewhere. The home farm and the agreement with dad were proving grounds for them to reach for heavier responsibility. Father and son deals have had the spotlight for a long time. Many of them have founded real dynasties of competent and successful farmers. Some of them have turned sour, however, usually on the old human side of things—for which few bankers and farm management specialists can guarantee a sweet solution.

In the eyes of many wise bankers who know country finance well, it is often hard to tell exactly whether some farm operators suffer from want of suitable, easy term credit whenever they ask for it; or whether some of their dilemma is due to their own hard luck. That is, a farmer may turn out to be a poor manager or have bad judgment in feeding cattle or choosing rotations and cash crops. This accompanied by price slumps and the ever present high cost of materials and farm facilities can put him in the doghouse as far as future sources of long-term credit go. The short-term credit afforded by the co-opera-

tive units supervised by the government also have these same things to meet and right now their loans are being examined more carefully than usual under a cautious admonition from the Department of Agriculture.

Even the best trained young farmer is open to error in some of his routine operations. So we have to face the hard fact that money advanced as ample credit by no means insures the success of a given enterprise. And with the rigorous conditions that farmers face in the realm of hazards and uncertainties due to weather and pest and disease ravages, we conclude that a call for more credit may not be the way to salvation. As a matter of fact, it is probable that farmers as a class have about as wide and deep a reservoir of existing credit at their command as any other occupational segment here. But when it is improperly placed or economic backgrounds turn bad, the clamor is loud enough to obscure the truth.

Loaning capital credit for farms of inadequate size often makes it hard to provide a necessary margin to service the debt and save for the future. This very situation over a period of years accounts for the increase in the size of farms, often made up of smaller units that failed. Too liberal use of credit for beginners can work to their own disadvantage. Aside from the direct burden to them and their need to keep absolutely healthy and alert to meet payments, a broad use of easy and extra ample credit bids up the whole farm field and adds to the capitalization figures that have already become menacing to the industry in some respects.

We have enjoyed but little scientific research on ways and means to make farming a more remunerative occupation in relation to the risk and experience devoted to it. Certainly we have not had this benefit as compared to the advances in the purely productive parts of agriculture. It may be presumed that one reason for this is the variability of human judgment and the almost inflexibility of countless costs and charges laid upon the doorstep of the young farmer from areas where he has not the slightest control. Taxes, insurance and interest charges, and even the going wages asked by competent farm labor, are often beyond the farmer's control in this complex interacting economy.

Even if the government buoys up slightly sagging farm prices with purchase agreements, loans and subsidies, as well as diversion of the slow moving surpluses here and there, the main limiting factor to a comfortable margin for the farmer still remains in his operating costs, both seen and unseen, and his own managerial

flexibility. As a result, few are looking for a genuine old style depression, but many are advocating a refresher course in tight rein management for many young beginners who have never known anything but boom time conditions.

The farm oldster about to get himself a storm cellar in which to retire and watch television is also pondering over what little there is left of the maybe-years ahead. Not long ago the social security people made some house-to-house inquiries among farmers of Wisconsin and Connecticut, asking them, among other things, if they favored adding farm operators to the legal list of self-employed persons to receive retirement benefits. The majority of those with frank opinions said that as things stand the farmer at retirement is not well enough heeled to withstand a long siege against the brutal forces of inflation and rising living expenses.

They believe that the self-employed farmer should be made a regular contributor and beneficiary of the federal social security system, like numerous professions in towns which are already covered. It shows that agriculture is none too secure at both ends—farms cost too much for beginners and savings are not sufficient for safe retirement.

It is against the grain of all born farm folks to be obliged to measure the success and satisfaction of agriculture with a business slide rule. In a financial way under modern conditions such deliberate niceties and reckonings are essential. They can be carried on w i t h o u t clouding the vision of the farm family to the natural environment that has always meant so much to country dwellers.

It still remains a fact that the city wage earner and his folks must carry their financial worries in a murky sphere of smoke and a barren realm of bricks and concrete, while the country family has the location as well as the occupation to fight for—a double reason to exercise the best judgment and the safest precautions in financial planning.

FARMER'S DIGEST SUMMER PUBLICATION DATES

During the summer months Farmer's Digest is printed and mailed to you every 45 to 50 days instead of monthly. This practice, started years ago, keeps our subscription rates down by giving you fewer copies during the months you have less time for reading. You will receive our June-July issue on or about June 15, our August-September issue on or about August 4. October and succeeding issues will again arrive near the first day of the publication month.

A Report on Fertilization of Pastures

The well fertilized pastures withstood last year's drouth best . . .

Condensed from The Shorthorn World

Dr. H. L. Dunton

RECENTLY, I stopped at a filling station to have a tire repaired. A number of people stopped and bought gas. The first customer said — "Fill her up — I have a long distance to travel." The second man said "Five, please," and the last customer said "50 cents worth." The distance that each man could travel on the gas he bought was readily seen. Then, I stopped and thought, "fertilizer for pasture and gas for car do about the same thing." Therefore, these three people buying gas illustrate quite well the different ways we are fertilizing our permanent pasture.

Some put on ample plant food or fertilizer in order to get the most economical growth, others put on just enough to get by and only get a fair growth but never really good growth, and still others put on such a small amount of fertilizer that the growth is very poor and generally they lose the stand of good grasses and legumes with weeds the final result. Of course, there are pastures that never receive any plant food and they are just about like the car that gets no gas—they don't move much.

I have visited many farms recently where the dry weather was given sole blame for the poor stand and growth of the pasture. Dry weather may have been the cause on your farm, but on many pastures I "walked over" the lack of fertilizer or plant food was certainly part of the cause. In practically every case, well fertilized pastures were able to withstand the drouth much better than those that were not. If pasture is the cheapest feed on a livestock farm, and we believe good pasture is, then we had better take a look at our pastures and fertilize them properly so we can produce the largest amount of this good feed economically.

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Aurora, Illinois

By fertilizing your pasture properly, you get not only high yields of quality forage but two weeks earlier grazing in the spring and two weeks later grazing in the fall. That, of course, means more money in your pocket. Top-dressing also gives your pasture a quick "comeback" after grazing or when rains come after dry weather. A well fertilized permanent pasture should furnish from 210 to 240 days of grazing each year. This is your cheapest source of feed since good pastures are worth about 75 cents a day per cow. This figure is based upon $75 a ton for dairy feed.

What do the pastures say themselves about the value of top-dressing? Observations by farmers of the necessity and value of top-dressing permanent pastures can be cited by the hundreds. As an example, a farmer in Virginia said the other day: "I am now grazing 16 steers where I grazed six, two years ago." This change is due entirely to top-dressing with fertilizer and lime. This farmer had no check, but he was sure his steers also gained faster this year.

But what do actual experiments say about proper top-dressing? Let's look at a few experiments. On a Cecil soil at the VPI research station well fertilized pasture produced an average yield of nearly three tons of a high quality forage composed of one-half ladino clover and one-half orchard grass. There were practically no weeds present. The unfertilized area gave about one-half ton per acre of a very poor quality feed, mostly weeds, since the clover and grass were gone. There was six times the yield on the well fertilized area.

At the research station at Orange, on a productive red soil, proper top-dressing increased the yield of ladino and fescue over a ton per acre. At the end of two years, there is a much better stand of clover in the well fertilized than the poorly fertilized pasture.

Experiments conducted in southwest Virginia on bluegrass-white clover pastures for a period of 12 years, showed that well fertilized pastures gave on the average more than twice the yield of poorly fertilized pastures. Not only was the yield doubled, but the fertilized pasture contained an excellent bluegrass-white clover sod while the poorly fertilized pasture was mostly bromesedge with a little bluegrass and practically no white clover.

We could give results of many more experiments and experiences but this is not necessary. Simply ask yourself the question honestly, do the pastures on my farm need top-dressing with fertilizer, or lime, or both to produce the best and most economical yield of the highest quality forage?

Ike's Own Farm

It takes on national significance in determining agricultural policy. Here the president has his feet on his own ground . . .

Condensed from Breeder's Gazette

Samuel R. Guard

DAY after the inauguration in Washington, I took the Greyhound bus to Gettysburg, Pennsylvania. You go right past the Maryland Agricultural college and the United States Agricultural Research Center at Beltsville. You go through Baltimore and before noon you see signs (monuments) of the Battle of Gettysburg.

You are on the Piedmont Plateau, a region of reddish clay loam that makes good corn and pasture land, both. You go out the Emmitburg, Maryland, Pike.

At the Peach Orchard, where Pickett's charge came down onto Meade's line, you turn right. Watch for the second lane to the left. That must be the president's farm, though you can't be sure yet, for there's no name on the mail box.

But it must be, because you see a young man in a red checked shirt and clean blue overalls leveling off the lane with a road scraper hitched to an Allis-Chalmers tractor. He must be getting it ready for the White House car. Sure enough, that's right. The boy is Dale Newman; he lives in Gettysburg and comes out every day to work for Ivan Feaster, who is President Eisenhower's farmer. Ivan lives in the old red brick house with his wife, Betty, and two children, a little girl, 3, and a boy, 5. He came here from West Virginia, first started to work for Ray Redding, son of Mr. and Mrs. Allen Redding, from whom Gen. Eisenhower bought this 189 acre farm four years ago for $24,000.

The deed in the courthouse calls for 189 acres and 75 perches. I didn't know what a perch was. Too shy to ask anybody, I waited until I got home and looked it up. A perch is the same as what we call a rod.

This year President Eisenhower will have on his own farm 40 acres of corn, 33 acres of wheat,

Reprinted by permission from Breeder's Gazette
Spencer, Indiana

40 acres of oats and 70 some acres in hay and pasture. A little stream called Marsh creek runs through this farm. Eighty years ago, come July 1, 2 and 3, it ran red with the blood of your grandfathers or great-uncles, but today it is bordered with bluegrass pasture, shaded by elms, maples and sycamores. There is a dandy stock pond.

President Eisenhower's farm is a dairy farm. He is milking 18 cows now — nine Holsteins and nine Guernseys. Nip and tuck between the two breeds! They are giving from 480 to 500 pounds of milk a day. That's about three and a half gallons apiece. The milk goes to Dunloggin Daries in Baltimore.

There is a Guernsey bull in the basement of the bank barn. And two new Guernsey calves and one Holstein. There are two Holstein and eight Guernsey replacement heifers in a sort of loafing pen. And sure enough, we met the fieldman for the Pennsylvania Guernsey Breeders' Association—name of Corey C. Garey, jr. His father is the manager of Flying Horse Guernsey Farm in Massachusetts. Last year President Eisenhower bred two Guernsey cows and 11 Holsteins artificially to bulls in the stud of the Southeastern Pennsylvania Breeding Co-op at Lancaster.

George E. Allen, the industrialist who wrote that scintillating book, "Presidents Who Have Known Me," owns the 80 acre farm next door, run by Robert Hefflin. Bob and Ivan find it advantageous to ship their milk together and to buy feed and supplies together. This they do in the name of Eisenhower & Allen. Sometimes the firm is known as DEGA—that being the initials of the two principals.

Besides the dairy cows there are two Spotted Poland China sows on the place. They will be bred to a Hampshire boar next time. Ike is selling his 150 White Leghorn hens. Like many another farmer he can't compete with the big specialized poultryman — not with eggs where they are today.

The main part of the old red brick farm house was built back in President Monroe's administration. The Pennsylvania Dutch built them to stay. Also they built two front doors, not one, entering the house from the front porch.

* * *

Four million cows, or 17 per cent of all cows in the United States were bred by artificial insemination in 1952.

* * *

When President Eisenhower wants his hired man to consult with the county agricultural agent he goes to the Adams County courthouse to see M. T. Hartman. If he wants to buy supplies he goes to the Adams County Farm

Bureau Co-operative Association to see Marion Stambaugh. If he wants to spread more lime he goes to still another office to see M. C. Walter, chairman of the County Production and Marketing Administration. And if he wants to put in terraces and plow on the contour he goes to a fourth office where Richard Long is chairman of the Soil Conservation Association. They're all separate and apart in Pennsylvania, though some farmers told me about going to Lancaster a year ago to hear the President's brother, Milton, make an address about this very problem of separate establishments and working together. But up to now such unity had not been effected. Is that just peculiar to the keystone state of Pennsylvania?

It is quite true that Ike and Mamie have not had much of a chance to visit their own farm in Cumberland township, Adams County, Pennsylvania. But now that the campaign is over, the cabinet selected, the inaugural address with prayerful invocation spoken, the information given to the congress of the state of the Union, the new administration launched, maybe there will be a chance for the president of the United States and the first lady to get up to their farm for a few days once in awhile. Brig. Gen. Arthur S. Nevins, Ike's staunch friend since West Point and the man on whom President Eisenhower depends to supervise his farm, will soon be back in Gettysburg from the Valley Forge hospital, and his name will go back on the RFD box. Thus the Eisenhower farm enterprise becomes one just like yours, the owner interested fundamentally in the price of raw milk, 220 pound shotes, eggs, hides, wheat, alfalfa seed, fertilizer, rotenone, lindane, tractors, manure spreaders, electricity. And as a farm owner he must be concerned with taxes.

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Any time the hog-corn value ratio is 12 bushels of corn to 100 pounds of hog, it pays to raise pigs, reminds Robert C. Kramer, agricultural economist. The ratio moved from 9 to 1 last fall to 13 to 1 in March.

* * *

Make no mistake: The man who carries the final responsibility for deciding the future farm policy of this nation is not Benson, or True Morse, or Dean Myers, or Senator Carlson, or anybody else at all but Dwight D. Eisenhower. That is why this farm paper editor is so glad that he owns a farm of his own. And that he is proud to tell any group: "You know, gentlemen, I own a farm."

New Methods of Orchard Pest Control

Systemics and biological control, including insect diseases, all bear watching . . .

Condensed from American Fruit Grower

David G. Hall

IF YOU could pull back a curtain and look into the future of insect control in fruit growing, what do you suppose you'd see? Entirely new practices? We've asked some of the top entomologists to look ahead for us and here's what they think they see.

Electronics?—Chances are very much against any presently known method of radioactivity or electronics taking the place of current insect control procedures. A faint chance exists that engineers may come up with something entirely new — something entomologists might adapt to the orchard. Nothing in this field is seen on the present horizon.

If anyone tries to sell you some kind of electrical device or a service that utilizes such devices, remember, you'll be made aware of new developments in this field through your major fruit growing advisers.

Systemics? — Until recently, chemicals that controlled insects infesting the trees by injection also killed the trees as well as the insects.

This is an old entomological hope—to be able to inject chemicals into the sap stream of a plant to kill insects later feeding upon it.

There has been considerable progress recently in this line of research. New organic phosphorus compounds have been developed. When these are applied to the soil around the roots or applied to leaves, they are picked up by the sap stream of the plants and carried to places where insects feed. So far, experiments show that several species of mites and aphids on some crops can be controlled very well by this procedure. Entomologists last summer found that the methyl group of a few of these systemic chemicals killed some of the chewing insects, while the older ethyl

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Cleveland, Ohio

group apparently affected only sucking insects.

Just what the effect these new systemic chemicals might have on consumers eating fruits from treated plants is a matter for the researchers. This obviously is a point that must be settled before fruit growers will be much interested in putting these new insecticides into their control practices.

Experimental work with such chemicals on fruit trees will be tedious and time consuming. Although new developments are coming steadily into this field of research, so far there appears no reason to think the new chemicals mean a radically new type of mite or aphid control in the fruit grower's future list of major bug killing weapons. But the chance exists.

New biological control methods — These methods have furnished much to fruit growers in the past. Insects that eat up or live at the expense of other insects is a phenomenon almost as old as nature. Some of the entomologist's most spectacular successes have been with biological control. The Vedalia beetle, brought into California from Australia in the late 1800's, saved the citrus industry in that state. A mealy bug threatened the apple industry of the Shenandoah Valley, Virginia, about 15 years ago, and entomologists imported parasites into the area that ended the trouble.

Entomologists search all the time for possibilities in biological control. The trouble with biological control is, many insects that damage fruits must be controlled almost 100 per cent, otherwise the fruit might not be marketable. When a parasite kills all of its hosts, it also kills off its own future. This means biological control is of service to fruit growers only in cases where complete control of the pest may not be essential—for example, in the cases of mites, aphids, mealy bugs or the like. Other more certain methods must be used in the case of insects that damage fruit itself, like the codling moth, red banded leaf roller, or plum curculio.

Success in the use of beneficial insects will continue, none the less, although progress in this field is always slow and uncertain. The most hopeful biological control possibility on our fruit insect control horizon may lie in the practical use of certain insect diseases. This is a radically new approach to the problem, being only a few years old.

Most insects have diseases, just as humans and animals do. Some of these diseases are caused by viruses, others by bacteria. An outbreak of the alfalfa caterpillar recently was controlled easily in California by applying a spray from an airplane. The spray was water containing juices of caterpillars that had died of one of

their own diseases. In another similar set of experiments, the entomologists controlled an outbreak of sawflies in a pine forest by using a disease.

A major advantage of this new method is that it doesn't interfere with our other insect control practices. Each disease is specific apparently for each insect species; it cannot cause buildup of other insects as DDT causes mite increase. Still another advantage is there isn't any residue problem. A disadvantage to the apple grower is that this method may be of little or no value in the control of the codling moth.

New kinds of equipment? — Radical departures from our more modern spray equipment do not appear on the horizon. Modifications will come about slowly from time to time, but nothing startling is on the designing tables.

So, here's the immediate future of fruit insect control — over-all methods appear more or less static right now. Biggest changes may come in the chemicals themselves, for new insecticides and miticides are arriving steadily from the chemical laboratories. Chances are good for changes in the kind of chemicals or their formulations.

Creep Feeding Is Profitable

Supplemental creep feeding of suckling pigs, whether under dry-lot or pasture conditions, results in more rapid growth and heavier pigs at weaning, according to studies at the Illinois Experiment Station.

Pigs weaned at seven weeks of age and continued on a mixed pig starter improved their weaning weight by about four pounds under dry-lot conditions. When sows and litters were grazed on rye pasture and self-fed shelled corn and supplement, creep-fed pigs out of the sows gained about 20 per cent faster than those not creep-fed. Hulled oats and pig supplement, dry artificial milk, or a mixed pig-starter ration were all equally effective in producing more rapid gains.

The experiments also showed that farmers can economize in the use of protein in feed supplements. Contrary to what might be expected, daily gains of pigs creep-fed rations containing 17 per cent protein were as high as those of pigs fed rations containing 20 or 23 per cent protein. These experiments involved 227 sows and 1,540 suckling pigs. — *Successful Farming*

ONCE OVER—

And Ready to Plant Corn

You may be able to save $3 an acre if you plant when you plow . . .

Condensed from Successful Farming

George D. Johnson

FARMERS in Michigan are trying once-over tillage, a new system of preparing ground to plant corn. And it's quite a far cry from the usual plowing, discing and harrowing. There's no reason why it shouldn't work nearly anywhere in the Corn Belt. The method also works where ground is plowed for spring small grains, potatoes, sugar beets and other crops.

The idea is this: Hold off plowing until you are almost ready to plant. Then, as you plow, pull one of several readily available implements behind the plow, which finishes the seedbed. *Plant the same day.*

This presents a few problems, but the list of advantages is a mile long. Six years of tests at Michigan State college have found that from $1 to $3 per acre can be saved in gasoline and wear on machinery. And the time it takes to get the ground ready for planting is cut nearly in half.

Packing of the soil is greatly reduced because of fewer trips over it. This means better conditions for root growth and increased release of nitrogen by soil bacteria. Rain penetrates the soil more readily.

Yields are the same or slightly higher the first few years, but as time passes a distinct advantage can be expected where once-over has been used.

Farmers mention the uniform rate and depth of planting they get in a properly prepared once-over seedbed. They've found that corn planted after once-over tillage usually requires fewer cultivations, sometimes only one—another saving in time and expense.

The problems involved vary

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Des Moines, Iowa

from farm to farm. It's best to have two tractors — one can be used to prepare the ground and the other to plant.

Plowing is slowed less than you would think. You hardly notice the extra pull of most of these implements behind the plow. The heaviest is equivalent to about one-half an added plow bottom.

Once-over tillage, if done improperly, or if planting is delayed too long, can result in very poor stands and usually a severe weed problem. Surface trash, too, must be well covered.

Here's the experience of a number of Michigan farmers who have used this method.

Lee Ferden of Saginaw County, Michigan, has used once-over the past several years. His yields have been as high or higher where he uses the new system, and he has noticed especially how his corn and small grain come up faster and outgrow weeds.

Ferden's farm is clay loam and he says, "I found that where once-over has been used a number of years I can plow in third gear. The first time I plowed in low."

Maurice Hughes of Van Buren County, Michigan, has used once-over tillage five years on both small grains and corn. He pulls a section of spike-tooth harrow behind his plow. Then he pulls a spike-tooth in front of his seeder. For corn he does go over his field an extra time with a spike-tooth before planting.

In suggesting it to others Hughes states, "There is no hard, fast rule. Each farmer has to take the idea home and fit it to his own situation."

He emphasizes the importance of good seedbeds. He says, "The tendency is to think, 'Once-over tillage, hurrah! Now we don't worry about seedbed quality. Get it done with little work.' This is not true. Good seedbeds can and must be prepared this way."

George Fritz of Van Buren County, like the previous farmers, is well satisfied with once-over. Being on a sandy soil, he does one thing differently. To get sufficient packing he moves his tractor wheels in when he plants corn and plants corn in the wheel marks.

D. A. Caul, Van Buren County agricultural agent, has been in the forefront of those urging farmers to try once-over tillage. After his sales talk, however, he points out that we can't throw away the discs and harrows. There are situations where conventional ground preparation would be better than once-over. One is where it is impossible to plant soon after fitting. Another might be where rain fell on some once-over tillage which had not been planted. Also, no one has much experience with once-over on winter wheat. The problem would be one of moisture, and most years you will

probably use the disc and harrow.

The research work which spurred the Agricultural Extension Service of Michigan to urge farmers to try the once-over method was carried out by R. L. Cook and H. F. McColly of Michigan State college. They saw a number of faults in our conventional planting preparations which were developed when horses supplied the power.

After six years their tests, on a number of soils varying from sandy to clay loams, have resulted in these conclusions:

Yields are as high where once-over preparation is used as where the usual methods (plowing, discing and harrowing) precede planting.

Weeds take less time to control where once-over is properly used.

Time and power required can be vastly reduced using the once-over method. Horsepower. hours to prepare the seedbed were found to be reduced from 28.6 per acre for normal tillage to around 16 for once-over. (A horsepower hour is equal to a one horsepower motor running one hour.)

If you are going to try this on a few acres this year, here are the things you need to do and consider.

Decide on what implement you will pull behind the plow. There is a long list of them, some especially designed for this practice—others you already have on hand. One of the most successful types tried by McColly and Cook was a section of rotary hoe pulled in reverse. This gives a packing action. The rotary hoe works best on lighter soils or on soils of good tilth, and can be weighted if necessary. It leaves a rougher seedbed than most once-over tools.

A section of spike-tooth harrow does a good job on easy-to-work soils, but will pull more sods to the top of the ground than a tool which rotates.

Farmers have also used short sections of packers and spring-tooth harrows.

Another successful machine used in the Michigan tests and built specifically for this practice consists of a frame and two shafts studded with pointed blades.

A plow packer, which can also be purchased, was used very successfully in the tests.

A mulcher was used successfully. It produces a good seedbed even in cloddy fields. Set properly, the spring teeth will not pull up sods.

There are other implements. A spring-tooth weeder for attaching behind plows is on the market. You can use any implement which will follow the plow and which will stir and smooth the ground while it's in a moist, crumbly condition.

Generally, the heavier your soil,

the heavier the machine you will need behind the plow. Weight can be added to most of them. You'll want your tractor to be in tip-top shape for the most speed.

The hitch you use is important. On a pull-type plow you can rig up an arm with a clevis on the end. Run a chain from your implement through the clevis and hook to the drawbar. *Hitching directly to the plow will throw the plow out of adjustment.*

On a mounted plow, hook well forward on the plow and rig up an arm to trail the implement far enough to the right.

The condition of the soil is very important in order to get the best possible seedbed. Farmers who have used this method are quick to point out that once-over will work well on almost any type of soil *when conditions are right for plowing,* but can make a "mess of things" if done at the wrong time. Extension Soils Specialist James Porter in Michigan, who has probably seen more actual farmer tests than anyone else, has this to say:

"If the field is dry enough for good plowing, it's all right for once-over tillage. We have all seen cases where a farmer wallows through and does a halfway plowing job when he shouldn't be out there at all. Once-over isn't for such cases."

Porter states further regarding the plowing job: "Once-over tillage calls for the return of plowing to an art. Plows must be selected for the particular soil, field cover and tractor. Colter and jointer must function properly for best trash coverage."

The importance of planting very shortly after plowing cannot be over-emphasized. You can either plow awhile and then plant, or have two operators, one plowing and one planting, which is ideal. The reason for quick planting is to take advantage of moisture and the mellow condition which exists even in the heaviest soils at least for a short time after a good job of plowing.

You also avoid a rain's spoiling your seedbed, and weeds have less chance of getting ahead of you. Generally, the pressure of the planter wheel packs enough; however, on sandy soils, packer-type implements can go behind the plow and planting be done in tractor tread marks.

* * *

June is almost always the best month to market spring lambs.

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Why not try a few acres prepared this way in '53? All you need do is leave a little plowing until you are ready to plant. Then plow it and plant it the same day. You have a spike-tooth section or rotary-hoe section which will give you the seedbed.

If You Want to Keep 'Em Healthy, Look Out for Lead Paint

Condensed from The Hereford Journal

Dr. J. W. Bailey

THE other day we saw a yearling heifer that had been out on pasture with 12 others of about the same age. She acted as if she was blind and staggered around as though partly paralyzed. She foamed at the mouth, ground her teeth and bellowed every once in a while as though in pain. The animal died in convulsions shortly after we arrived, with her head pulled straight back and all four legs stiffened in a final spasm. Some of the other heifers were showing signs of being sick, too. Within the next couple of days three more animals died, showing the same symptoms as the first victim.

The owner suspected anthrax, but a search of the pasture finally revealed an old paint pail as the source of trouble. It had been thrown into a "sink hole" where it should have been safely out of the way in a tangled wilderness of brush and briars. However, the heifers had beaten a way to it, and there was plenty of evidence that the pail had been licked both inside and out. This was bad business indeed, for the paint was labelled as containing lead.

Occurrences of this kind aren't new, for lead compounds seem to have a fatal fascination for cattle, particularly the younger animals. It doesn't take very much to cause trouble sometimes, either, and the small amounts are often unbelievable when compared with the damage done. We once saw five calves that had been killed by licking at a painted piece of board that was only a couple of inches wide and little more than five inches long. On another occasion a young bull was killed after taking a few licks at a part of the painted stock rack that was used to make a pen for him in one corner of the barn. Cows have repeatedly been killed by eating grass on which spray materials have blown from near-by orchards and fields. On several occasions animals have died after

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Kansas City, Missouri

drinking water that was carried through lead pipes, usually when the water was soft and incapable of crusting the pipes with insoluble lead sulfate.

Lead is practically indestructible and in paint may remain dangerous for unlimited periods. We recall one case that involved a sign that was over 30 years old which was used in a barn to keep calves from lying down close up against a wet concrete wall. However, the animals started licking at the paint and died of lead poisoning instead of pneumonia, so it didn't help much. On another occasion a pail was salvaged from the dump where it had lain for years and was used to supply water in a calf pasture. It wasn't used long, though, for the two calves that drank from it soon sickened and died. On another farm several steers died after being turned into a lot where the board fence had been painted about 10 years earlier. Investigation showed that the deaths were due to animals licking at paint which contained large amounts of lead. Similar stories are common around the country in regard to lead and livestock.

Treatment isn't likely to do much good, for by the time symptoms appear the brain is usually so badly damaged that nothing can be done. When caught early enough various drugs like epsom or Glauber salts may help through changing the lead into an insoluble sulfate. In general, though prevention is a lot more practical than remedies. Several desirable measures can be listed in the form of a program of "don'ts."

1. Don't throw paint pails in pastures or barn yards.
2. Don't use them for feeding or watering animals.
3. Don't use lead paint on stalls and fences.
4. Don't allow signboards in pastures or places where animals can lick them.
5. Don't use lead pipes, especially if the water is soft.
6. Don't spray with lead compounds where it may blow into pastures.
7. Don't use painted racks for making calf pens.

Approximately 25 million persons are employed in satisfying the demands of agriculture. Ten million are employed directly on the farms, nine million in handling, processing and distribution, and six million in providing essential raw materials, machines, equipment and other goods and services necessary to modern agriculture.

GRASS SILAGE

It has changed our way of feeding cattle. Now, self-feeding silos let the cattle do the work . . .

Condensed from The Ohio Farmer

Delmer E. Groves

TWENTY years ago the Ohio Agricultural Experiment Station did a strange thing. A field of legume-grass meadow was cut —but instead of curing the crop in the field and storing it in the haymow, the crop was chopped green into the silo.

Farmers who viewed (and smelled) the results of that early experiment at Wooster were frankly skeptical of the pickled hay. Both chemical analysis and feeding experiments with animals showed that "grass" silage could be substituted for corn silage, although there were differences. Gradually, the practice found favor and today farmers all over the country are making and using grass silage.

Increased use of soil conserving crops and rotations have made greater and greater amounts of good meadow crops available. There's a big surplus of meadow crops on many farms and the natural tendency is to preserve the crop by putting it in the silo. Silos often creak and groan and spill juices from the pressure of high moisture crops. Tower silos now on farms will not hold all of the crops available for ensiling and this has led to the use of substitutes.

We find grass silage made in trenches, boxes, stacks, paper lined snow fence units and a dozen other contrivances. Some are temporary, some are semi-permanent methods. In many cases, the use of temporary storage methods will lead to construction of permanent silos.

In 1952 Milton Falb of Wayne County, Ohio, tried the ultimate in grass silage. He erected a self-feeding tower silo and built a pole shed around it for feeding out cattle. It worked! The cattle cleaned out the silo and gained over a pound a day, according to Falb's estimate, while they were doing most of the work for him.

The silo was filled on June 14,

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Cleveland, Ohio

which is about two weeks later than usual for Milton Falb. The first crop from an 18 acre field which was about one-third timothy and two-thirds alfalfa and clovers was mowed. A mower with windrower attachment was used and the crop picked up (after wilting) with a field chopper set for one-half inch cut.

Sulphur dioxide was metered into the wagonloads of forage. This job was done out in the field with a homemade applicator and even then gas masks had to be worn by the men working the blower at the silo. Falb thinks he will use corn and cob meal this year for a conditioner.

The silo was opened November 19 by removing the lower two courses of metal staves which protected the silage in the self-feeder portion of the outfit. A pole type shed had been built onto the barn as a lean-to with the silo being the only center brace in the 39 foot square structure. One side of the shed was left open and a barnlot 85 by 50 feet fenced in for the steers.

The cattle averaged about 650 pounds when the silo was opened. Falb estimates they gained an average of a pound a day from then until January 19 when the silage ran out. A plastic silage cap weighted down by water protected the top surface of silage so that little spoilage took place. The water was drained when the silo was opened but the cap was left in place.

Brothers Fred and Paul Linder of Huron County make maximum use of tower silos for preserving meadow crops. They fill two Harvestores with 125-135 tons each and also a 10 by 40 tower silo. Last year they put 40 tons of meadow crop in a small stack in a corner of their winter feeding lot but it didn't keep well.

Grass silage is almost the complete ration for over-wintering beef cattle on the Linder farms. Fattening cattle also get grain.

Merlyn and Alto Miller feed grass silage with practically no hand labor on the J. E. Miller and Sons farm in Erie County. From 20 to 30 minutes are required to pass the silage to 100 cattle and all the labor needed is enough to turn switches on and off.

A 17 by 40 foot Harvestore was erected at the end of the feeding shed. This shed was originally a dairy loafing pen 56 by 120 feet. A concrete feeding platform was built from the silo out into the shed for a length of 76 feet. This trough is 50 inches high and has eight inch curbing on it. The floor of the trough is 32 inches wide.

A single chain barn gutter cleaner runs in the channel down one side of the trough and back the other. A rack made of one and a quarter inch iron pipe is

imbedded in the concrete curb and extends four feet high to keep the animals from getting into or jumping over the feeding trough.

An enclosed breezeway connects the silo to the feeding pen. An automatic bottom unloading device digs the silage out and kicks it into the head of a 14 foot auger section. The auger elevates the silage nine feet and dumps it out onto the gutter cleaner on the feeding platform. The entire system is geared together and run at a slow speed by electric motors.

The gutter conveyer is geared down to run slowly so it can carry a heavy load of silage. The cattle eat silage as it moves along. When the silage has been moved down one side of the trough and back to the starting point on the other side, the day's feeding has been done and the machines can be shut off. Feeding is done twice a day.

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Chemical weed control without additional cultivation can increase corn yields from 10 to 40 bushels an acre, says the USDA.

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Since these are over-wintering cattle, grass silage is the only feed they get. When the system is used for fattening cattle, grain can be metered into the head of the auger. This would also help prevent the moist silage from clogging the head of the auger, which happens once in a while.

Another type of conveyer for feeding grass silage is in use on the Dwight Wise and Sons farm in Sandusky County. They use a drag link conveyer belt which is built around the feeding trough along one side of their feeding barn. It is powered by an electric motor and hangs free from an overhead metal shaft.

The entire feeding trough can be raised by winding the suspending chains onto the overhead shaft. Thus it can be kept clear as the manure pack builds up.

One of the most successful stackers of grass silage in the country is Harvey Born of Lorain County. His success with outside stacks has led other farmers to try this system of preserving silage.

Louis Risser and Son put 45 acres of meadow crop into one stack on their Putnam County farm. Built in a corner of the barnlot, the 200 ton stack was 20 by 30 feet and was built to a height of 20 feet. Most of the crop ensiled was good quality alfalfa-bromegrass-Ladino clover mixture. The crop was wilted, picked up with a field chopper, conditioned with corn and cob meal and put on the stack with an elevator rather than a blower.

The stack was "built like any good straw stack," according to the senior Risser. Several loads

could be dumped between levelings but the stack was kept high in the center at all times.

Feeding to beef cows and calves started early in August. At first a feeding rack was built to allow the animals to self-feed. It proved to be more work to keep the rack at the stack and to keep it well braced than to leave it in one place and throw the silage down off the stack. The Rissers are happy with the results. They claim there has been very little spoilage and even the musty material has been fed or used as bedding in the concrete barnlot. In extremely bad weather, silage can be fed from a protected tower silo at the center of the shed.

A stack of long grass silage was made last summer at the United States Soil and Water Experiment Station in Coshocton County. L. L. Harrold is project supervisor at the station. The reason for trying a long grass stack was to find a system for making greater use of the forage crops being grown in southeastern Ohio without investing in expensive forage harvesting equipment.

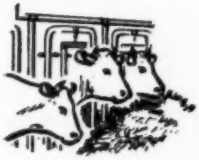
The meadows were mowed, wilted and raked with a side delivery rake. The crop was picked up out of the windrow by a buck rake in loads of 700-1,000 pounds and hauled to the stack at the end of the barn. The stack site had considerable slope so that the buck rake could be driven onto the stack from the highway. Compaction of the 16 by 40 foot stack was done with a heavy rubber tire four wheel tractor.

Different surface treatments were tried on the completed stack but none worked really well, for there was spoilage over the entire stack. C. F. Rogers, agronomist at the experiment station, estimates that a fourth of the silage was lost by spoilage and rejection.

The silage was fed to 36 good two year old Hereford steers. The stack was opened early to avoid the muddy mess of outside feeding in late winter. Fed free choice, the cattle ate about two and a quarter tons of silage per head for the three months it was fed.

At first a feeding gate was built across one end of the stack to be moved back as the cattle ate into the stack. A chain saw had to be used to cut 20-30 inch sections of the silage loose for feeding. It became so much work to move the feeding gate back and keep it solidly blocked that this idea was abandoned.

Rogers and Harrold found that although less expensive equipment was required to make long grass silage, more work was needed to feed it out. They want to try more long grass silage stacks before making recommendations.



Report on the latest remedies of

KETOSIS IN DAIRY CATTLE

Condensed from The Rural New-Yorker

Dr. L. H. Schultz

KETOSIS or acetonemia is a metabolic disorder in dairy cattle that is of much importance. Its greater recent incidence is usually attributed to increased feeding of cows for higher milk production, as well as to the fact that it is more readily recognized than it was several years ago.

Ketosis occurs 10 days to six weeks after calving and usually in high producing cows. Most of the cases occur between the months of December to April, with few cases in the summer when the cows are on pasture.

Symptoms of Ketosis

Outward symptoms of ketosis can generally be grouped under two headings: Digestive and nervous. The digestive disorders take the form of lack of appetite, rumen inactivity and constipation. Sometimes there is a depraved appetite. Usually the cow is dull and listless, but occasionally she may be hypersensitive and easily excited. A cow with the latter symptoms is considered to have the nervous type of ketosis. There is also decreased milk production and loss of weight.

Analysis of the blood of cows with ketosis reveals two major changes from the normal. One is a decrease in sugar; the other is an increase in blood ketones. Normal blood sugar levels range from about 45 to 60 milligrams (mg.) per 100 milliliters (ml.). In ketosis the blood sugar level may be as low as 20 mg. per 100 ml. The symptoms follow the blood sugar level more closely than the blood ketone level. Normal blood ketone levels range from three to five mg. per 100 ml. In ketosis the blood ketone level may go as high as 60 or 70 mg. per 100 ml. Ketone bodies are eliminated in the urine, milk and breath. A common diagnostic test for ketosis is the Ross urine test, which tests for acetone in the urine. This test can be made by a veterinarian.

Few cows die of ketosis, but when they do, the most obvious

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333 West 30th Street, New York City

symptom on post mortem examination is a fatty liver. There also may be some degeneration of certain endocrine glands, such as the pituitary and the adrenal cortex.

Treatment for Ketosis

A search of the literature on ketosis over the past 20 years uncovers articles in which about two dozen different substances have been reported to be beneficial for treatment. However, most of these have not stood the test of time. The standard treatment over the years has been the injection of glucose into the jugular vein. This treatment, an attempt to correct the low sugar level of the blood, is sound and reliable. The greatest disadvantage is the fact that the injected sugar is used up fairly rapidly and, if the cow has a severe case of ketosis, she may relapse and require several injections, at considerable expense.

Chloral hydrate, a drug with a sedative-like action, has been used with some success for many years for treatment of ketosis. It was originally used to quiet nervous cases, but it also appears to have some value for the digestive disorder cases.

Some have used cortisone for the treatment of ketosis and report marked success. It is injected intramuscularly and apparently exerts its effect through its ability to stimulate formation of sugar from other substances in the body. At the present time its extensive use in the field is limited because of high cost, but substantial price reductions comparatively soon are probable.

Because the quantity of acids produced in the rumen of cows with ketosis was found to be low and b e c a u s e propionic acid seemed to be rather specific for increasing the sugar level of the blood, it seemed desirable to try a salt of propionic acid for treatment. The acid itself was ruled out for treatment because of possible acidosis and difficulty in handling the liquid acid.

Results With Propionates

We have information, including blood data, on 25 cows treated with propionates. All responded well with the exception of one cow that had a bad uterine infection. Three of them showed relapses and were treated a second time. All of these cows were "off feed" and down in milk production at the time treatment was started. Blood sugar was low and blood ketones were high. The most marked response was in the return of blood sugar levels to normal. Response in milk production followed the i n c r e a s e in blood sugar rather closely. Appetites usually improved in from one to two days. Blood ketones returned to normal more gradually, but most of the cows were down to normal levels in 10 days.

In a few cases the ketones re-

mained slightly above normal, even though the cows appeared normal in all other respects. All of the cows were on winter rations, except one; she responded to treatment while on pasture. Although in her case the blood sugar response was rather slow, she was considered normal after 10 days of treatment.

The propionates were given orally in two administrations daily. In mild cases it appeared that one-quarter pound daily was sufficient. This is probably about the maximum that cows will take in the grain because the stuff is not very palatable. One-eighth pound daily is apparently not enough because one cow showed increases in ketones following reduced dosage. In more severe cases a half pound daily was more effective. When this larger amount was given, and when the cow was not eating grain, it was necessary to give it by capsule or drench.

The sodium salt is very soluble and one-quarter pound will dissolve easily in a pint of warm water. The calcium salt is somewhat less soluble than the sodium salt of propionic acid.

Extension Economist Gives Wheat Outlook

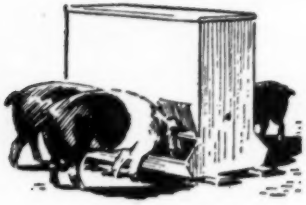
United States farmers will not harvest as much wheat in 1953 as last year, according to recent estimates. Production will be down about one-fourth—from 1,291 million bushels last year to 921 million in 1953—if estimates prove accurate.

According to Earl Moncur, economist with the Wyoming Agricultural Extension Service, winter wheat production is estimated at 611 million bushels and spring wheat at 310 million. Although winter wheat prospects have improved, it is still too early to predict the outlook because of uncertain moisture conditions and lack of information on winter survival.

Explaining the recent wheat price rise, Moncur points out that large quantities were placed under the current support program and little "free" wheat is entering the market. As a result, prices have risen and may soon reach the support price. This will tend to bring government stored wheat on the market.

One thing seems certain, Moncur says—there will be plenty of wheat. "If we produce 921 million bushels, add a 1952 carryover of 560 million, deduct the 680 million estimated for home use, and export 325 million, we will still carry over 476 million bushels — an ample reserve to see us through at least one poor crop year."

University of Wyoming



Hog Lot Bandits

They take millions of dollars. Prevention and control are the cure . . .

Condensed from The Southern Planter

Geo. C. Herring

Extension Animal Husbandman

HOG growers are annually robbed of millions of dollars by a group of bandits.

These bandits hide and develop in the filth and manure and litter of the farm hog lot, and too often unsuspected by the owner, attack young pigs. They take their toll by lessened and more expensive gains, by lowering the resistance to disease, and in the condemnation of the meat in market places.

There are a number of these hog lot bandits, but two of them head the list. They go under the scientific names of *Ascaris suis* and *Stephanus dentatus.* You know them as the common round worm and the kidney worm.

Dr. Ray M. Batchelder, in charge of animal pathology at the Holland Experiment Station, in Virginia, studied the extent of loss from condemned livers at three slaughtering plants in southeastern Virginia. Of the 33,655 hogs checked during the year ending June 30 of last year, 65.8 per cent of the livers were condemned, 12.9 per cent were trimmed, and only 21.3 per cent were passed.

The monetary loss from condemned and trimmed livers at the three plants was estimated by Dr. Batchelder at 60.5 cents per hog slaughtered or $168,273 for a 12 months period. Hogs would be worth at least 25 cents more per hundred pounds of liveweight if they had good livers. There are some other losses from condemnations resulting from parasites, in addition to that of the livers. All losses of this nature, of course, have to be passed back to producers in lower prices paid.

The loss of meat from parasitized animals is no doubt small in comparison to that suffered by producers in lessened and more

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Richmond, Virginia

expensive gains of pigs. Tests made in Coastal Plain sections of Georgia showed that pigs with moderate infestations of various worms, took five weeks longer to reach market weight than pigs with no or only light infestations. The wormy pigs also required 80 pounds more feed for each 100 pounds of gain. It has also been estimated that each round worm harbored by a pig requires an extra pound of feed. It is a pretty safe bet that producers of eastern Virginia alone are robbed of near a million dollars per year from swine parasites, most of it by the two culprits, the round worm and the kidney worm.

How Parasites Reproduce

The eggs of the round worm are picked up by the pig from the soil, they hatch in the intestine and the young worms go to the liver in the blood vessels. From the liver, they go to the heart and the lungs. After a few days in the lungs they crawl up the wind pipe and are swallowed. They then develop to maturity. The millions of eggs laid by female round worms pass out in the droppings.

The eggs of the kidney worm reach the soil through the urine. Under favorable conditions they hatch in a day or two and the larvae, or young, become effective in four to six days. The larvae may be swallowed by the pig or they may enter the body through the skin. They find their way to the blood stream and to the liver, lungs and other organs of the body. Some of the worms eventually get to the kidney fat and then to the kidneys and ureters, the walls of which they penetrate which completes the cycle.

The answer to the parasite problem is simple. It is one of sanitation. The carrying out of a complete sanitation program that will afford maximum protection is not so simple. Such programs for the control of swine parasites are described in detail in USDA Farmers Bulletin 1787 which can be secured from county agents.

What to Do

While most farmers will not carry out such programs completely, most of them would do something about the problem if they knew what the parasite bill was on their farms. Much progress could be made by observing a few rules:

1. Have sows farrow under clean surroundings. This might be in a central house with floors that can be thoroughly cleaned or it might be in individual houses placed on clean land.
2. Move sows and litters to clean pasture when pigs are around two weeks old, if you can.
3. Don't let pigs run on old hog lots until they are at least four months old.
4. Plow up old hog lots.
5. If you don't do anything in the way of sanitation, or only do

a partial job, you should treat pigs for roundworms. The sodium fluoride method is recommended because it is near 95 per cent effective in removing roundworms from the intestines. It is easy to give and the cost is low.

You can treat pigs best after they have been weaned and are adjusted to feed. Usually this is when pigs are about 10 weeks old. Use second treatment when they are around four months old, if needed.

Feed pigs for only one day on a mixture containing one part, by weight, of sodium fluoride and 99 parts, by weight, of dry ground feed. Remove all other feed.

Use caution. Remember, sodium fluoride is a poison; treat it as such.

Follow directions for mixing closely. Too much sodium fluoride in the mixture will kill pigs; too little won't do the job.

Do not feed mixture as slop. Slightly underfeed pigs the day before treatment. Supply plenty of water.

Sort out pigs of near equal size for treatment. Adjust pigs to dry ground feed a few days before treatment if they have been fed differently.

Unfortunately, there are no effective treatments for most other internal parasites of swine. Control lies in prevention.

Feed Situation More Favorable

The feed situation is more favorable this year than in 1952, United States Department of Agriculture economists report. Total stocks of feed grains were five per cent greater, in comparison with the number of livestock on farms, at the start of 1953 than a year ago.

Less feed was used during the fall and early winter because of fewer grain eating animals on farms and because less feed was used per animal. Feed requirements of livestock were reduced by high quality corn in the Corn Belt and mild weather in most parts of the country. Economists estimate that prices of grain feeds will probably continue lower than a year ago through the first half of 1953.

Farm and Ranch News

The U.S.D.A. has offered to buy unspecified quantities of domestic beef to help stabilize the market. This beef will be turned over to the school lunch program and other eligible outlets. This will be the first time the department has bought beef since the drought days of the mid-1930's.

Lambs Are Saved During Pregnancy

Condensed from Sheep Breeder

Dr. A. J. Dyer
University of Missouri

IT IS THE number of lambs saved that counts . . . that reflects the know-how of the sheep man, the equipment used and the inherent maternal qualities of ewes that make up the flock.

The shepherd must like sheep, must determine their needs in advance and provide what they need at the proper time. Providing a good ration during pregnancy and lactation is one of the most important steps to successful sheep production.

At full term pregnancy, a ewe should be gaining in flesh; not merely in body weight, for this may be caused entirely by foetal development. The last third of pregnancy or approximately the last seven weeks thereof are the most exacting because two-thirds of the foetal development is made during that period of time. The lactation period is even more exacting than the gestation period because the total milk production contains much more nutrients than what is stored in the body of the new-born lamb. Young ewes, yearlings, coming two's, will require a better ration than a mature sheep.

Sheep are ruminants or cud chewing livestock and consequently well adapted to make use of roughage. Given all the good quality legume hay that they will consume and access to a mixture of equal parts by weight of steamed bone meal and salt, no other feeds are necessary during late pregnancy for a healthy, well grown ewe between 2 to 6 years of age. Concentrates should be added in the lactation period unless the ewe lambs late and shortly thereafter has access to all the good quality pasture that she wants.

During late pregnancy, if silage is available and free from mold, it can furnish half the roughage and hay the remainder. Or, if no

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Chicago, Illinois

hay at all is available or is too high in price, silage can make up the entire ration if protein concentrate, either soybean, linseed or cotton seed meal is fed at the rate of one pound daily to five ewes, and feeding-grade limestone, one ounce to every two ewes is furnished daily.

Most sheep men feed some grain, either one or more, and a supplement. When grain is fed, the amount of legume hay may be reduced to half, but a stomach filler, either straw or grass hay or some other low grade roughage should be furnished to make up the difference. About the grains, threshed oats is excellent. A bushel (eight gallons) weighs 32 pounds and from one-half to one pound can be fed daily per ewe. Corn! Some swear at and others swear by corn. It is an excellent high energy feed, but must be fed judiciously. A good sized ear per day per ewe will furnish about one-half pound concentrates per head daily. That, and one pound protein concentrate to every five to ten ewes, three pounds legume hay or a half full feed, should prove to be very satisfactory.

The components of a ration used frequently and a standard at the University of Missouri, is a mixture made up of 60 pounds of shelled corn, 30 pounds either oats or wheat bran or a mixture of the two, three pounds of legume hay and access always to steamed bone meal and salt has given very good results. In some cases, silage has replaced most of the hay.

The amount to feed of any ration depends upon the condition of the ewes, both as to whether they are thin or fleshy, or whether they are in late pregnancy, or early lactation, etc. The man on the job can best determine their condition because he knows the situation. The lactating ewe needs more feed than the pregnant ewe.

A few things about the newborn lamb care: Paint the navel cord promptly with tincture of iodine. Squeeze out the wax plugs, if present, in the ewe's teats. See to it that the lamb nurses within 30 minutes to an hour after birth, prevent chilling, examine the lamb's eyes for inverted eyelids—they may need to be sewed open. Put the ewe and her offspring in a four feet by four feet pen to themselves, give her water and feed sparingly the first day if she is in good flesh and suckles well. Attention to these details will help to produce a satisfactory lamb crop.

How FFA Sparked This Farm's Modernization

. . . and led to a happy father-son partnership

Condensed from Electricity On The Farm

R. E. Johnson and J. H. Metcalf

DOES your son's interest in mechanical devices make you wonder whether he will stay on the farm after he finishes school?

Many promising young farmers have given up a good opportunity on the farm to go into some other type of business. They believed they could make more money in industry. If you suspect that some distasteful farm job actually drove them from the farm, you probably come closer to hitting the nail on the head.

When this problem had to be faced on the Von Seggern farm, Fulton County, Ohio, it solved itself. Here's the way it worked.

Before 1939, a dairy herd of 8 to 10 cows and 100 hogs raised and fattened in the farm's modern swine barn, paid the bills. But that year young Frank Von Seggern, who does not like to milk, was a Future Farmer student in the high school at Wauseon, Ohio. In classes he discovered there was an "escape" to his liking, in fattening beef cattle. He made good with his first steer project. He was allowed to go ahead in this business. Soon the steers had pushed dairy cows off the farm—all except two kept for the family milk supply.

In addition to feeding steers as an FFA project, Frank worked hard in the school shop under the direction of his agriculture instructor. He built many pieces of farm equipment and featured this project with an excellent power-operated farm elevator. In recognition of his efforts, he was awarded the American Farmer degree in 1940.

The father took a real interest

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New York City

in his son's ability to make mechanical equipment to speed and ease farm chore work. After school, when Frank returned to the farm as a partner, his father planned improvements with him. He helped to build and install the equipment required for more efficient work.

It is readily apparent that they have made an outstanding success of this program.

The more important results of this father - son undertaking on this 160 acre farm are: Mechanization of all tillage and harvest operations; pressure water system for the houses and all farm buildings; elevators for field and barn service. There is an efficient beef cattle barn equipped with a hay self-feeder arrangement. There is also the modern corn storage building with floor conveyor to carry ear corn from the bins to the grinder. The grinder discharges the corn and cob meal into an overhead pneumatic conveyor which transports it directly to the overhead bins located adjacent to the cattle feeding bunkers in the barn.

Because the feed conveyor stands out where travelers can see it, the installation marks the farm as different and progressive. This line is 120 feet long and is 28 feet above the ground at the inlet end. It is used twice weekly for approximately one-half hour at a time to carry the three ton weekly requirement of corn and cob meal.

The conveyor's reason for being, of course, is the modern crib which has a capacity for 3,000 bushels of ear corn. It is filled by an inclined elevator which carries the corn up to a ridge line conveyor. This, in turn, evenly distributes the corn in the bins from only one setting of the elevator.

While the Von Seggerns have made all the farm improvements themselves, this mechanized crib and pipeline is the most pretentious. They estimate that it would cost around $4,500 to erect if all material had to be bought and all labor hired.

Besides the feed preparation and handling facilities, there are other improvements such as: Replacing the ground floor oat storage with overhead bins; electric brooders for the 100 pigs raised annually; and, improved equipment to care for the 50 to 80 steers fattened each year.

What does this impressive setup mean in terms of saving time and work?

Instead of carrying silage to the steers, it is wheeled to the feeding bunkers from the silo. Chopped hay is pushed into the self-feeders with little effort. Before they had the hay self-feeders they went into the mow twice daily to pitch down hay. It was real work and it took hours instead of the 30

minutes the job now requires each week.

Mr. Von Seggern said that with the ample space they give the cattle, each animal eats all it wants when it wants it. The plan promotes uniform g r o w t h and there is much less scouring from overeating due to "spot" feeding.

Prior to having the new mechanized crib, shelling c o r n and grinding required five hours a week. Now the twice a week task is done in one hour's time.

The mechanized pressure water system has practically eliminated the time and work factor in water distribution throughout the farmstead.

The younger Von Seggerns, and two children, live in the cottage across the road from the homeplace. Frank has modernized it throughout.

Working as a team, each family is able and does take a vacation each year without disrupting the farming business schedule.

Reminiscing for a moment, the elder Von Seggern proudly interjected: "Modernization of our farm really began when our son began his studies under the FFA program."

Lambs Pay More on Early Markets

Lambs usually bring at least $5 a hundred more in July and August than they will average during the rest of the year. "July and August are almost always the best months for sheepmen to market spring lambs," says Ralph Grimshaw, extension specialist at Ohio State university. "It is normal for market lamb prices to take a sharp drop after the summer peak.

Grimshaw says growers who get spring lambs on July or August markets use most of these practices: 1. Feed each ewe that has twins two pounds of grain a day with all the good legume hay she will eat until she goes on pasture. Ewes with single lambs probably need only one and a half pounds of grain.

2. Creep feed lambs on mixture of cracked corn, 20 pounds; oats, 20 pounds; bran, 10 pounds, and soybean meal, 10 pounds. Many growers who have large crossbred ewes say creep feeding is not necessary if ewes get plenty of grain and all the legume hay they will eat.

3. Put lambs and ewes on pastures as soon as it is ready.

4. Drench ewes in April with phenothiazine. Dip or spray the whole flock shortly after shearing if ewes have ticks at shearing time. If ewes have ticks at shearing time, lambs probably will have them a week later. *Ohio Extension Service*

Is Your Lease a Good One?

Check your contract against these questions . . .

Condensed from Nebraska Farmer

Dr. Philip A. Henderson

HOW good is your farm lease? If your answer depends on whether your point of view is that of a tenant or a landlord, it is probable that your definition of a "good" farm lease does not agree with some of the following ideas.

Simply stated, it might be said that the job of a farm lease is to set forth the details of the agreement under which a farm is to be operated, the contributions of the land-owner and the tenant, and the manner in which the farm receipts are to be divided.

It should be as simple as possible, easy to understand, and fair to both parties involved. Yet these requirements are too general to indicate much about how good a lease might be. Actually, farm leasing is an extremely complicated problem. So let's raise some questions about some of our leasing practices.

1. Does your lease give a boost to good farm management?

Good management calls for the operation and care of a farm in such a way that earnings will be maintained at as high a level as possible over a long period of time — regardless of whether the farm is rented or owner-operated.

A good lease should stimulate farm management, not inhibit it. It should take into consideration the long-run interests of owners, tenants and society as a whole.

2. Does your lease make for sound business?

A good lease should encourage businesslike methods in farming. Each part of the lease should be able to stand on its own feet. It's not good enough to have the total receipts divided in proportion to the t o t a l contributions of the landlord and tenant. The receipts from each major part of the farm business should be divided at nearly as possible in proportion to

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Lincoln, Nebraska

that part of the business. Then if one part of the business is dropped or another is added, a new lease is not necessarily called for.

3. Is your lease the result of custom?

Many of the difficulties with leases today are the result of using agreements which are not suited to the conditions found on the farms involved.

Technically, no two farms should have exactly the same lease. The kind, amount and quality of some one or more factors of production will differ from that found on every other farm. Practically, it is not possible to measure these differences accurately enough to reflect all of them in farm leases. This is particularly true of share leases involving livestock.

Custom is an extremely important factor in farm leasing and should not be considered lightly. However, the mere fact that a leasing practice is customary does not necessarily mean that it is equitable. This is especially true when you consider our very rapid technological advancements and the effect they have had on the relative contributions of landlords and tenants.

For example, farms in most areas vary considerably in soil productivity. Yet, because the custom within an area is for farms to rent for two-fifths of the crops, it is probable that both the good and the poor producing farm will rent for the same share. This could only be justified on the grounds that the good farm attracted a tenant with better equipment and a higher degree of managerial ability, while the poor farm could only obtain tenants with poor equipment and less ability. Actually, this argument is probably not too well founded since the farm rental "market" is not that well adjusted, even though there is a tendency in that direction.

4. Should share rent cover the use of buildings as well as land?

It is difficult to justify the renting of an improved quarter for two-fifths of the crop and little if any cash rent while the adjoining unimproved quarter, with the same kind of soil, rents to the same tenant for the same share of the crop. Both arrangements can't be right.

If you assume in this situation that the share of the crop given as rent is adequate to cover the use of the entire farm, including the buildings, then the owner of the unimproved land is receiving too much rent. If that is right, then the whole basis of crop-share rental is open to question, since it throws all of the burden of rent payment on the soil in the final analysis, and none on the buildings. It encourages the landowner to liquidate his improvements since the cost of maintain-

ing the buildings is not directly related to crop production and hence, the rent received, except to a very small extent.

If, on the other hand, you assume that the share of the crops given as rent should only cover the use of the land directly involved, then obviously, the rent paid to the other landlord is inadequate to cover the use of the buildings. If that's correct, it would appear that cash rents for improvements usually are far too low—if measured by the cost of keeping up a set of buildings.

Of course, a tenant should not be expected to pay cash rent which would be adequate to meet the maintenance costs on an over-improved place. Nevertheless, a farm which is only adequately improved easily has an annual building maintenance cost of $300 to $400 (taxes and repairs), and more when the depreciation, interest, repairs, taxes and insurance are considered. Yet, how many farm leases call for cash rent equal to these amounts?

An ambitious tenant who wishes to own a farm of his own can't buy a farm and keep up the buildings for any less. If he were to attempt to buy the bare land and put the buildings on it, his costs of maintenance would be much higher than this. So it is that landlords cannot afford to, and will not replace even a minimum set of improvements under these conditions. Tenants will gradually be forced to pay a higher price (cash rent) for the privilege of having a satisfactory set of buildings to use as headquarters.

It is difficult to think of any other business in which the lessee even hopes to get the use of a set of buildings to be used in his business without paying cash rent for the use of them. Usually this cash rent is high enough to pay at least the cash costs of maintaining them, and in the long run it must be high enough to pay all of the costs including depreciation and interest, else the investor will proceed to liquidate or abandon such improvements. This is what is happening on farms where the buildings are being torn down. The number of farm improvements is constantly being reduced in line with the demand, but the forces of competition necessarily work slowly in opposition to custom, costs and other deterring factors.

5. Does your lease favor either the landlord or tenant?

Competition between landlords for tenants and between tenants for farms has had and will continue to have an important bearing on leasing practices. Adjustments brought about by this means have not always been to the best interests of the earnings of the landowner and/or tenant.

In some cases, for instance, tenants or landlords, knowing that

they had the advantage in bargaining power, have attempted to draw up leases which they thought would be favorable to them. They didn't realize or else didn't care what effect it might have on them or on the farm over a period of years.

In fact, many of those who attempt to draw up leases on this basis do not fully realize all of the short run implications. An example of this might be the landlord who insists that the tenant should stand all of the baling expenses and still give the same share of the hay crop. If he succeeds in making such a deal stick, the tenant is almost sure to be unhappy.

Other enterprises on the farm which require less effort and less expense on his part in comparison to the contributions of the landlord become more attractive.

If the corn needs cultivating when the hay is ready to cut, chances are he will see to it that the corn gets cultivated while the hay waits. It is to his advantage to make sure that the corn crop is well taken care of since his share of the net profit from corn is proportionately greater than in the case of hay (assuming that the contributions of the landlord and tenant are about equally divided in the case of corn.)

And, when it comes time to seed a new field of hay, the tenant will not be too concerned with the success of the seeding. Fewer legumes may be raised, with the result that yields of corn and other grain crops suffer.

6. Is your pasture rent fixed or flexible?

Cash rental for hay and pasture (or for buildings) might well be changed from a fixed basis to a flexible one. As the price of hay goes up or the price of cattle or milk goes up, the amount of cash rent would automatically go up. On the other hand, if the prices of these end products go down, the amount of cash rent would also go down.

There would probably have to be some lag in setting such rents, using the indices of prices for the preceding year. A fixed amount would be paid during the pasture season, for example, and adjustment payments could be made to the index used as a guide for adjustments. Use of the pasture during the following season could be contingent upon the payment of this adjustment. The basic level of such rentals would be the value of the pasture production over a long period of time. The cash rent should represent something less than the value of the landlord's share, however, since the tenant assumes all of the risk of variations in crop yields.

7. Does your lease encourage the adoption of progressive practices?

The lack of technical information, the lack of operating capital,

or just plain unwillingness to cooperate on the part of one party or the other have served to hinder the progress on some rented farms. For example, if it is reasonably certain on the basis of soil tests and the experience of neighbors that the use of fertilizer pays on soils similar to those found on a particular farm, then from the standpoint of good farm management, fertilizer should be used.

If, because of any of the reasons mentioned, the lease (oral or written) provides that either the landlord or the tenant must stand all of the cost of any fertilizer used while getting only part of the benefits, it is not likely that much fertilizer will be used.

The result of any such provision in a lease would be that both parties involved would probably pass up potential profits; less food and feed would be produced; and the productivity of the farm would be more apt to go down hill. The long-time earnings of the farm would be reduced.

8. Is your livestock share lease equitable?

Leasing problems become much more numerous and complex where livestock is involved. The kind and amount of livestock kept, and the relative importance of livestock compared to the rest of the farm business are some of the things that complicate matters.

It is not often that the same fifty-fifty livestock share lease can be equally fair on both a dairy and a beef breeding herd farm when you stop to consider that dairy cows require several times as much labor as beef cows.

9. Does your division of expenses penalize any part of your business?

In the areas where farms rent for one-half the crops on a crop share basis, what justification is there for the landlord to pay half of the fuel and oil bills under a livestock share lease when he doesn't under a crop share lease?

Supposedly the argument would be to offset some of the tenant's labor in taking care of the landlord's livestock. Sooner or later, however, some tenants will discover that it is to their advantage under this kind of an arrangement, to devote more of their resources to crop production and less toward livestock production. Their net returns are greater from crops than from livestock because their contributions to crop production costs are smaller compared to those of the landlord. Eventually if this happens, the landlord will become dissatisfied. If instead of paying part of the fuel and oil bill, the landlord would pay something toward the labor bill to take care of his share of the livestock, the cause of this kind of trouble might be largely removed.

NITROGEN ON CORN

So long as price relationships stay as they are, you can afford to make large use of nitrogen fertilizers . . .

Condensed from Ohio Farm and Home Research

C. J. Willard

HEAVY applications of commercial nitrogen are making it possible to produce more corn and grow corn more often on the same land.

All commonly recommended rotations are built on the idea that nitrogen is too expensive for standard farm crops, except in very limited quantities. This was the belief earlier because of the great cost of enough nitrogen to produce a reasonable yield of corn. It takes 1.5 pounds of nitrogen to produce a bushel of corn and the stalks to grow it. To apply 1.5 pounds of nitrogen at 23 cents a pound (estimated figure) to produce a bushel of 50 cent corn was economically unsound, but now, with nitrogen at 15 to 18 cents and corn at about $1.50, it may be profitable.

Rotation Provides Data

Significant data on this problem have come from rotation experiments on three Ohio experiments farms. On each farm the nitrogen experiments involved only a few plots.

On each of the farms there were plots on which corn was grown continuously; one plot with all stover removed, one or two plots on which the stover was left. At the end of 1945, there was no significant difference in the yields of the two treatments on any of the farms, but the continuous corn plots were yielding from less than one-third to about two-thirds as much as corn in the best rotations.

For at least 70 years, agronomists have been demonstrating that growing corn continuously gives low yields. Exactly the same fertilizer treatment has been given to the continuous corn plots as to the rotation plots. Corn requires more nutrients from the soil than most other crops, and it is hardly

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Wooster, Ohio

fair to expect yields to hold up under continuous corn unless those nutrients are supplied.

Nitrogen Plowed Down

In 1946 at the Holgate and London farms, we began on these continuous corn, stover returned plots to plow down 500 pounds per acre of sulfate of ammonia—100 pounds per acre of elemental nitrogen. Earlier, half of each plot at Paulding farm was treated with 60 pounds per acre of elemental nitrogen.

At Holgate and Paulding a three year rotation of corn, oats, and a sweetclover-orchard grass mixture was set up. Orchard grass was used because it is not shaded out by second year sweetclover as timothy would be, and because it is certain to catch in spring seedings. At both farms the sweetclover stands were often poor because of sweetclover weevil attacks. When the sweetclover was killed by mowing in June of the hay year, the orchard grass came on and made a heavy sod by the time it was plowed for corn in late fall or early spring.

Plowing under this large amount of low grade organic matter resulted in corn with yellow leaves because of nitrogen shortage; beginning in 1946 this plot received 100 pounds of nitrogen per acre at Holgate, and 60 pounds at Paulding, plowed under in the fall when the sod was plowed for corn. The yields of these tests are compared to the best rotation yields in the table.

One hundred pounds of nitrogen plowed under with the corn stalks at London and Holgate on soils depleted by many years of continuous corn has built them up to the point of yielding more than the average corn yield of the state. At Paulding, 60 pounds of nitrogen doubled the yield of the continuous corn plots without nitrogen. The good standard three and four year rotations are still far superior in yield to continuous corn, but when nitrogen is added to a good grass sod, the yields of these standard rotations are equaled or exceeded.

Nitrogen Helps

These results illustrate the principle that low grade organic matter plus nitrogen can often do as much for soil productivity as high nitrogen sods from legumes. Presumably (as illustrated by the good results from the sweetclover-orchard grass rotation, which are probably partly due to the tilthing action of the sweetclover) there will come a time when the large deep root system of the legumes will give an advantage on these heavy clay soils that grass sod or corn stalks plus nitrogen cannot furnish; but this principle adds greatly to the flexibility of our possible rotation practices, provided commercial nitrogen can be obtained at a price low enough to be paid for by the increased

Corn Yields from Nitrogen Plowed Under. Rotation Experiments, Paulding, Holgate, London

Treatments in Addition to basic fertilization* on all plots	Yield Per Acre		
	1948-1949***	1948-1950***	1948-1951
	Paulding	Holgate	London
	Bu.	Bu.	Bu.
Av. 2 best rotations**	91.4	92.8	85.4
Continuous corn, no nitrogen, stalks off	21.6	39.8	53.8
Continuous corn, stalks left on, 100 lb. per acre nitrogen plowed under at Holgate and London, 60 lb. at Paulding	39.7	69.0	73.8
Corn, oats, sweetclover, orchard grass rotation, 100 lb. per acre N plowed under at Holgate, 60 lb. at Paulding	107.2	100.4	

** The rotations were corn, oats, alfalfa, alfalfa, and corn, oats, alfalfa-brome, alfalfa-brome, at Paulding; corn, oats, alfalfa-brome, alfalfa-brome and corn, oats, alfalfa-orchrd, and alfalfa-orchard, at Holgate; corn, wheat, alfalfa-clover-timothy, alfalfa-clover-timothy and corn, soybeans, wheat, alfalfa-clover-timothy, at London.

* The basic fertilization was 150 pounds 0-20-20 per acre per year at Paulding, 200 pounds 0-12-12 per acre per year at Holgate, and 300 pounds 0-12-12 per acre at London.

*** The Paulding County Experiment Farm was discontinued in March 1950, and the Northwestern Experiment Farm in March 1951.

yields.

For example, 100 pounds or more of elemental nitrogen plowed under with the stalks would be quite likely to prevent any decrease in yield in second year corn over first year corn. In an emergency this could be done for three years, or even longer. Some are talking about continuous corn, the situation we had at all three places. However, that cannot be recommended as a regular farm practice. We are trying to develop principles, not necessarily actual working rotations.

From the results in the sweetclover-orchard grass rotation, it may be desirable to plow under nitrogen with legume-grass sods. Certainly, as long as price relationships are similar to the present, it is possible to make large use of nitrogen in corn culture, and modify current rotations in doing so.

Prevention of Bloat in Dairy Cattle

Tests show proper feeding and management will prevent most cases . . .

Condensed from Guernsey Breeders' Journal

S. W. Mead

University of California

SO MANY theories have been advanced to explain why bloat occurs in cattle, it is not surprising that there should also be many suggestions as to means of prevention. For the most part, recommendations have been based on field observations rather than on the results of controlled experiments.

The results of our investigations indicate that most cases of common bloat occurring on legume pasture can be explained by the inability of the animals to eliminate ruminal gas in a normal manner by means of belching. This, we think, results from insufficient feed in the rumen contents of such an irritating nature as to stimulate the belching reflex. The accumulating gas eventually results in so-called bloat which, in severe cases, may cause death.

By proper feeding and management we believe most cases of bloat may be prevented.

Insufficient information concerning the characteristics of the pasture and the conditions involved in the preventive measures has often, however, tended to contradict our theory as to the cause of bloat.

When there is danger from bloat, many livestock men feed hay prior to turning onto pasture, or they may provide hay in the pasture. Results have been quite variable depending upon the amounts consumed, the quality of the hay, and the succulence of the pasture.

In Riverside County, California, on a permanent irrigated pasture of 160 acres divided equally into four fields, bloating was so serious as to require a man to

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Peterborough, New Hampshire

watch the cattle during the day; and no pasturing could be done at night because of the difficulty in watching the cattle. The pasture consisted of about 70 per cent ladino clover and alfalfa and 30 per cent grasses.

Upon suggestion by Farm Advisor N. L. McFarlane, available oat straw was placed in racks in the center of the 160 acres accessible to cattle in each 40 acre field. The number of cases of bloat was reduced, but the situation was still hazardous. It was suggested that possibly the distance to the hay racks prevented the maximum hay consumption. When a portable hay rack on wheels was moved to the center of the 40 acre field currently in use, bloat ceased to be a problem.

Many studies of bloat have been hampered because the investigators were unable to produce bloat at will. In our studies on the cause and prevention of bloat, we have never failed to induce bloat at will on alfalfa pasture, except in one field to which I will refer later. In all we have produced at will about 500 cases of bloat during the course of our investigations.

This has been accomplished by making use of pure, thick stands of immature alfalfa 8 to 14 inches tall. The pasture was free of weeds and grasses. The cows received no hay prior to turning onto pasture; and since feed may remain in the rumen for 60 hours, maximum bloat may not occur until the cows have been deprived of hay for two or three days.

Very young alfalfa, four to six inches tall, seemed to be unpalatable and unsuitable for bloat studies. Under these conditions, cattle will consume the less succulent alfalfa on the drier levees used to check irrigation water. Each field is tested before and during the study for its capacity to cause bloat.

The necessity of using pure stands of immature alfalfa unadulterated by weeds, dry material, or grasses was brought forcefully to our attention during the course of one of our early experiments. Thirty dry cows were turned into a thick stand of immature alfalfa. When, after two hours, no cases of bloat occurred it was noticed that the cows were feeding along the fences, ditch banks and levees. On closer observation, it was found that the cows were eating certain dry, wiry weeds and the less succulent alfalfa. Though the cows remained on this pasture for several days, no cases of bloat occurred.

Later, there were several cases, after the weeds and drier alfalfa had been eaten. The weeds and drier material being coarser than the more succulent alfalfa, we believe, had protected the cows while it lasted either because of

its physical character or because the cows ate it instead of consuming larger quantities of alfalfa.

In our experience, no cow has bloated until she has been on alfalfa pasture at least one and one-half hours. Of 41 cows that bloated during one of our experiments, 27 bloated during the first three and one-half hours.

In our studies of the use of alfalfa hay for the prevention of bloat on alfalfa pasture, we have shown that the overnight feeding of alfalfa hay gave variable results depending upon its quality. Coarse hay was more effective than finer stemmed hay. This may explain in part the variation in results obtained under practical conditions.

We have been most successful in preventing bloat through the feeding of sudan-grass hay during the night before pasturing on alfalfa the next day. Under our conditions, cows would not eat enough sudan-grass hay during a two hour period just before pasturing to prevent bloat, since the sudan-grass hay was not of excellent quality. However, 17 pounds consumed during the night prevented bloat in all cows pastured the following day.

To test the value of providing sudan-grass hay while the cows are pasturing alfalfa, we first tested the field as usual for its capacity to produce bloat. Of 28 dry cows, 11 bloated the first day. On the following day, sudan-grass hay was made available in the field so as to provide 8 to 10 pounds per animal. That day four of the 28 cows bloated. These cows had received no hay prior to this for 48 hours and were observed to eat considerable pasture before moving to the hay. On the third day there was only one slight case of bloat, and thereafter there was none until the hay was again removed from the pasture. We have also been successful in preventing bloat on alfalfa pasture during the day if the cows have been pastured on sudan grass during the previous night. But the simultaneous free choice of adjoining sudan grass and alfalfa pastures as a means of preventing bloat was completely ineffective, since the heifers ate no alfalfa until the very palatable sudan grass was entirely eaten off.

In our studies, free access to barley straw prior to turning onto alfalfa pasture was ineffective in preventing bloat. The most our cows would consume of the barley straw was five pounds, which we concluded to be insufficient to prevent bloat.

It would appear from our studies that an unpalatable roughage may not be effective in preventing bloat because of the small amount consumed, while a palatable hay such as fine stemmed alfalfa is also ineffective, even

though considerable is consumed, because it is not sufficiently irritating to the rumen. Sudan grass, both green and dry, is effective because it is both palatable and sufficiently irritating because of the scabrous nature of the leaves and the woody lower part of the stem to induce the reflex act of eructation.

Many California livestock men appear to have been quite successful in preventing bloat by making use of pasture mixtures consisting of grasses and legumes. While pure stands of ladino clover are extremely hazardous, experience indicates that mixtures containing as much as 50 per cent grasses are quite safe. The problem, though, is to maintain a proper proportion at all seasons. No well controlled experiments involving mixtures of grasses and legumes in the prevention of bloat have come to our attention.

Another practical procedure is to pasture alfalfa only after it has reached the early bloom stage when the stem has become considerably more woody. In our studies bloat was produced only on pure immature stands of alfalfa. The possibility of producing bloat on more mature alfalfa pasture was not investigated thoroughly, since we were interested primarily in preventing bloat on alfalfa that is capable of producing maximum bloat and in being able to produce bloat at will. Under practical conditions, livestock men in California with the most experience never turn cows onto alfalfa pasture until it has reached the early bloom stage.

We have observed that, when first turned onto alfalfa pasture, cows will eat only the tender tops of the plant. It is at this time that bloat is most prevalent. In one experiment, we harvested the tops of immature alfalfa and fed these in the barn. Twelve cases of bloat occurred in four cows over a nine day period. While we have not investigated the bloat producing capacity of the whole plant cut green and fed in the corral, this is being put to practical test in a large operation in California. So far, no cases of bloat have occurred. The owner feels that, after the initial expense of mechanization, the cost of operation is no greater than the conventional pasturing system.

An experience we had last summer may be of interest. A dairyman 50 miles north of Davis reported serious bloat trouble. His pasture, he reported, consisted of a mixture of grasses and ladino clover in about equal proportions. In addition he was feeding alfalfa hay prior to turning onto pasture each day.

We were at a loss to explain the large number of cases of bloat occurring daily in this herd. Upon visiting the ranch and examining the pasture, we found that the

dairyman was only partially correct in describing his pasture. True, it consisted of ladino clover and a high proportion of grasses, but two factors had been overlooked. First, the pasture had not been clipped, and as a result the grasses were quite mature and apparently unpalatable. Second, there were patches of almost pure ladino clover, which showed evidence of being eaten almost to the exclusion of the grasses. The alfalfa hay, fed before pasturing, was very leafy and fine stemmed; this we have found is not very effective in preventing bloat.

The following day upon our recommendation the dairyman bought a supply of oat hay and started on a program of feeding this each morning before turning into pasture. No cows bloated following this procedure.

Steer Profit in 'Finishing'

The top sale dollars always go for the well finished animal—no matter what the beef market trend, advises George A. Branaman, Michigan State college. Feeders rushing steers to market without proper finish are cheating themselves. If they sell for fear of a market drop, they lose money by forcing their steers into a lower grade, he explains, and at the same time help depress the market. He cautions, however, that it does not pay to hold steers from sale when they are finished for their grade.

A downward trend in the beef market generally makes a bigger difference between high grade and low grade steers and recent cuts have hit the lower grades hardest. This situation probably will continue until the end of the big movement of grass fed animals and then lower grades should pick up. From now until spring, there doubtless will be the usual lowering in prices for the higher grades—with more winter fed beef cattle, with more finish, arriving.

When the supply of cattle without finish is up, the feeder who puts a finish on his animals will get a better price. When the supply of finished cattle increases, the feeder needs that finish on his steers to compete. It always pays to put a finish on steers.

Michigan State College

How to Apply Nitrogen Fertilizer to Produce More Protein

Tests show time of application may determine whether wheat is "hard" or "soft." . . .

Condensed from Missouri Ruralist

Dr. William A. Albrecht

INCREASE in the so-called "hardness" of wheat, or tendency toward a higher protein content (as one moves westward across Missouri and Kansas), long has been associated with decrease in annual rainfall.

Careful study, however, tells us soil fertility and not weather, or particular grain variety, is responsible for concentration of protein in it. A high concentration results when a generous supply of nitrogen is delivered by roots to tops just before "heading" takes place. For high protein or hard, horny grains, roots must have access to adequate supplies of available nitrogen at that stage of the plant's development. If these supplies are not already there, they can be provided through applications of soluble nitrogen in fertilizers for the same effects.

That this belief is correct was established by Dr. R. L. Lovvorn and Prof. M. F. Miller at the University of Missouri. They demonstrated wide differences in "hardness," or in concentrations of crude protein, in grains of a single variety of wheat. This was accomplished by successively later applications of nitrate fertilizers at intervals of two weeks from April 4 to May 29 on a series of plots.

On this soil, with its shallow surface layer overlying an acid, tight-clay subsoil, successively later applications of soluble nitrogen gave increasingly higher concentrations of crude protein in wheat. Kernels were less and less yellow in color and more nearly translucent. They were harder. Percentage of protein stepped up from a minimum of 8.9 for the

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Topeka, Kansas

early application to a maximum of 17.0 for the later one. This was an increase of 8.1 per cent. It was a relative increase of almost 90 per cent by the higher over the lower concentration.

Here on this acid soil, developed under heavy rainfall, variation in stage in plant growth at which nitrogen was made available to the crop produced as wide a range in concentration of protein as has been recorded for the entire wheat crop from Missouri to western Kansas. So right here in Missouri, which is regarded as a "soft" wheat state, apparently we can have any kind of wheat and any kind of flour from "soft" (biscuit) to the "hard" (light bread) kind, depending on soil fertility rather than on weather or variety. So wheat is "hard" not according to the way we breed it, but according to the way we feed that important crop with soil fertility.

Time of applying nitrogen affects not only concentration of crude protein in grain, but also total yield per acre of both grain and protein. Although the late application increased concentration of protein in grain, it reduced yield of grain. It also reduced yield of protein. Yields of grain dropped from 22.2 to 11.7 bushels per acre. Yields of protein fell from 160 to 91 pounds per acre. These were the data for singly managed plots and for different dates of nitrogen application.

Here is the suggestion, then, that for much vegetative growth and large yields of grain, nitrogen must be available plentifully but early in the growing season. For a high concentration of protein in the grain, extra nitrogen must be available plentifully but shortly before "heading" time. By correlating application of nitrogen with physiological processes of the wheat plant (so as to decide whether nitrogen is used by the plant to make mainly vegetative mass or to create protein in grain) one should be able to produce both a large yield of bushels to the acre and also a high concentration or per cent of protein in the grain by using nitrogen in fertilizers.

This timing of nitrogen going into the plant at a particular growth period helps explain natural differences in protein content of wheat from eastern to western Kansas. If a single strain or variety of wheat (grown across Missouri and Kansas showed such increases in concentration of protein in the grain on going westward), should those not be attributed to the possibility that roots find soil strata with more available nitrogen at successively later dates in the plant's growth period? If this is true, it follows that extent of delay in roots making contact with the generous ni-

trogen supply would depend on depth of nitrogen containing strata in the soil profile. Making this contact in the greater soil depths just before "heading" time means "hard," horny or high protein grain.

We do not know of any report of similar studies of the concentration of crude protein in corn grain, as related to application of fertilizer nitrogen at specific periods in the plant's growth. But if this explanation for wheat gives us a principle, then it should be one that is true for corn, also. Declining protein in corn during the past decade, and growth of it on humid soils, all tell us we can scarcely expect much of any protein in corn if we do not look to applying more nitrogen. Suddenly increased yields in recent times from nitrogen (in growing over 100 bushels to the acre) give us a suggestion that such is very probably true.

Only as fertility of soil feeds soil microbes and plants so they can create their own proteins, can they pass them on so our livestock can pass proteins in meat, milk, eggs and other foods on to feed us.

We must learn to manage our fertilizer nitrogen wisely for that significant food purpose as the variation in so-called "hardness" of wheat suggests we can.

Milk Price Drop in Time, Saves Crash

The recent drop in milk prices came in time to forestall an even greater decline later, says Mervin G. Smith, extension economist at Ohio State university.

Smith explained that when milk prices declined, it discouraged operators of other farm enterprises from entering the dairy marketing field. If dairy prices had remained high while other farm prices were low, many farmers would have shifted to milk selling. The "inevitable" dairy price decline would have been even greater when it did come, Smith said. He pointed to the dairy-beef relationship as an example.

In times of low beef prices, many western and midwestern beef growers sell milk instead of feeding it to calves. "There will be some shift from beef to dairy marketing during the next few months but it will not cause sharp dairy price drops," Smith said. "On the other hand, dairymen probably will not be turning away from their enterprise because of more favorable prices in other enterprises."

Ohio State University

THE 17-YEAR LOCUST

They can do great damage to your orchard. Here are recommended control measures —

Condensed from Pennsylvania Farmer

Dean Asquith

IN MAY, 1953, orchards in 35 southeastern counties of Pennsylvania will vibrate to the high, shrill calls of male periodical cicadas or 17 year locusts. The piercing din will announce that after 16 years and 10 months in the ground Brood X has emerged and the females will soon be ready to deposit eggs for the next generation.

If the female cicadas were going to lay their eggs in the ground or on weeds, orchardists probably wouldn't g i v e them a second thought. But they are not going to do that; they are going to deposit their eggs in slit-like punctures they will cut in the twigs and small branches of trees. They may inflict 3,000 to 5,000 cuts on a single mature apple tree, causing many twigs to break and die. Obviously, to protect his trees an orchardist's job is to prevent female cicadas from laying their eggs.

To combat cicadas successfully, it helps to have information concerning their habits and numbers. Probably the best way to secure this knowledge is to trace the life history of Brood X (the designation of the brood that will appear in 1953) from the time the full grown nymphs left the ground in 1936.

Seventeen years ago next May, cicada nymphs, resembling small crayfish, burrowed to the surface of the soil in orchards and woodlands to emerge through holes about a half inch in diameter. Some of the nymphs constructed mud "chimneys" two to three inches in height around these holes before coming into the open. All the cicada nymphs in one locality did not leave the ground at the same time, but large numbers appeared for several nights during the emergence period.

After l e a v i n g the ground, usually at sunset, the nymphs

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Pittsburgh, Pennsylvania

crawled upon the trunks of trees or stems of weeds to which they clung firmly. Their skins split down the middle of the back and the adult, winged cicadas slowly worked their way out. They remained on their supports overnight to dry out and to stretch their wings. As the temperature became warmer the next morning, the adults abandoned the supports and their cast-off nymphal skins to fly about sucking sap from the trees and mating in preparation for egg laying. This period before the start of egg laying covered five to ten days, but the injury to the trees caused by the feeding of the cicadas was not serious.

Finally, the female cicadas were ready to deposit the eggs for the next generation, the one we shall see in May, 1953. They placed the eggs in slits cut in twigs and small branches with their ovipositors, egg laying appendages. Usually 12 to 25 eggs were placed in each puncture and one female may have laid as many as 400 to 600 eggs, making the number of punctures needed to complete her egg laying. From the time an adult female cicada shed her nymphal skin until she died, she lived above ground a total of 30 to 40 days.

The eggs in the twigs hatched in six to seven weeks. The young, antlike nymphs burrowed into the ground beneath the limbs. They have lived there since 1936, securing food by sucking sap from tree roots. In some orchards that were attacked by cicadas in 1936, there are 250,000 to 500,000 nymphs per acre completing their development in preparation for their emergence in May.

So many cicadas may be found in infested orchards because there were no satisfactory control methods available in 1936. There is a good chance now that fruit growers can reduce the population of cicadas in orchard land by taking advantage of recently developed control measures.

Within the last five years entomologists in Virginia and Ohio have discovered that sprays of TEPP, tetraethyl pyrophosphate, are effective killing agents for adult cicadas. By using this insecticide intelligently a grower can protect his bearing fruit trees from serious damage in 1953 and, at the same time, cut down on the number of cicadas that will live in the soil until 1970.

You will recall that adult cicadas are present in the orchard for several days before the females begin to deposit eggs. During this period the number of adult cicadas is increasing daily, but they are causing no serious injury to the trees. This is the time for patience. Do not spray yet. Inspect your trees every day for egg punctures.

When you find the first egg punctures, it is time to start spray-

ing. Mix 40 per cent TEPP at the rate of six liquid ounces in 100 gallons of water. Apply the spray as a mist that will envelop the trees quickly, and cover your orchards as fast as possible. Spraying during the cool morning hours before the cicadas begin to move about is more effective than spraying later in the day. It is well to remember, however, that it is better to get your orchard sprayed as soon as you can after you find egg punctures than to wait for cool weather.

Follow-up sprays will be needed to kill new adult cicadas as they appear. In most cases, the best time to apply the second spray will be five days after the first one, but in heavily infested orchards the second spray may have to be put on in three days. Three

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Average milk production in the United States has been increased more than 1,000 pounds per cow in the past 25 years.

* * *

applications of TEPP will probably be enough to protect most orchards. Exceptions will be small orchards surrounded by cicada infested woodland and those rows of trees in larger orchards that are close to woodland.

Sprayer operators should remember that TEPP is an organic phosphate insecticide. To use it safely they must follow the precautions printed on the label.

The problem of protecting young trees, especially those one to three years of age, from injury by cicadas is difficult because a small number of females can puncture all the bark surface in a comparatively short time. Reinfestation by damaging numbers of cicadas following an application of insecticide can occur much more quickly than in bearing orchards where it takes a larger population to cause serious injury.

Experience has shown that the best way to protect young trees is to wrap the trunks and larger limbs with paper and cover the tops with mosquito netting or tobacco cloth. Also, in young orchards where the roots of the trees have not had a chance to spread in the top soil beneath the cover crop, disking just before the nymphs emerge may prevent many of the insects from completing their development and it will not harm the trees.

In spite of the difficulties involved, some growers may still want to try to control cicadas in young plantings with sprays of TEPP. There is a chance they may succeed if they follow a schedule of two or three sprays a week during the period adult cicadas are active.

Remember as you plan that cicadas can in a few weeks destroy the results of three or four years of careful orchard management.

MAKE MINE PIPER

In Michigan tests, Piper Sudangrass showed many advantages in addition to less poisonous hydrocyanic acid . . .

Condensed from The Michigan Farmer

Milo B. Tesar
Michigan State College

IF YOU are going to grow sudan grass for supplementary pasture this year, choose Piper sudan to make it an even better emergency pasture. Piper is more productive than common or sweet sudan, makes more growth in late summer, has a high resistance to leaf diseases, and has a much lower level of hydrocyanic (prussic) acid than any variety known. Many seed houses should have Piper available for planting in 1953.

Piper was developed at the Wisconsin Agricultural Experiment Station with the primary objective of getting a variety low in hydrocynaic acid potential which can cause animal poisoning if sudan grass is grazed while it is short. High yield and leaf disease resistance were incorporated, making this variety adaptable for several states in the north central region.

Sudan grass grown on fertile soil is the best emergency pasture crop in many sections. It has an extensive root system and continues to grow during the dry months of July and August when regular pastures may be unproductive. This ability to produce during hot weather makes it popular with dairy farmers who need a highly productive pasture to supplement their regular pasture in July, August and September. It is especially valuable to the farmer who discovers in early spring that he will have too much livestock for his legume-grass pasture during the summer. For this farmer, sudan grass sown between May 20th and June 10th should be ready for pasture six weeks later and will give him pasture which should carry one cow per acre during July, one and a half cows per acre during August, and one cow per acre during September.

Because of the importance of

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Detroit, Michigan

sudan grass as a supplemental pasture, the farm crops department of Michigan State college has been testing sudan grass varieties since 1949. Varieties tested were Piper, sweet sudan, which is now grown on many Micbigan farms, Tift from Georgia, and common sudan grasses obtained from local seed houses. Tift was tested only in 1949 and 1950 since its low yield during these two years showed it to be inferior to other sudan grasses.

Results of four years' testing showed Piper was the highest yielding variety in 9 of the 11 tests. Piper yielded 3.07 tons of dry hay per acre; about one-third ton more than the two commons (2.79 tons) or sweet sudan (2.76 tons. Sweet and common sudan yielded about the same during the four year period.

Piper had the lowest amount of hydrocyanic acid (HCN) of any variety tested, having only one-half that of sweet or common sudan grass. Although no cases of HCN poisoning of livestock pasturing sudan grass have been proven in Michigan, other states have reported some. The low HCN content of Piper is desirable because it reduces any possible chance of poisoning, increasing the value of Piper as a superior variety.

Leaf diseases cause a browning and drying of the leaf which often make livestock prefer the greener leaves on the plant. Common sudan grass has an excessive amount of these leaf diseases, but both Piper and sweet sudan have very little, which increases their value for pasture.

Common and Piper are somewhat earlier and taller when heading than sweet sudan grass. Piper heads about four days later than common and about a week earlier than sweet sudan. It is finer stemmed than sweet, being about like common in this respect. Piper and sweet are more leafy than common.

Farmers often remark that one of the reasons they grow sweet sudan grass in preference to common is that the stems are sweet and juicy and well liked by livestock. This observation is confirmed by a test which showed that a Guernsey cow preferred sudan grass in the orders sweet, Piper and common. However, since all sudangrass varieties are very palatable at nearly all stages of growth, farmers should not select sweet sudan just because it is so palatable. Three years' results from a Texas experiment show that even though sweet sudan was more palatable than common sudan, beef cattle gained the same on both varieties, indicating that sudan grass, regardless of variety, is sufficiently palatable.

Piper produced the greatest amount of regrowth following cuttings in August. It was fol-

lowed by common and sweet sudan in that order in the amount of regrowth produced. The high regrowth of Piper is desirable since it shows that after being pastured closely in August it will recover to produce September pasture at the time of the year when legume-grass pasture should not be grazed.

Results of the four years' data of testing support the following conclusions and recommendations in the choice of sudan grass varieties:

1. Piper should replace other varieties as soon as enough seed is available, since it produced about 0.3 tons more hay per acre than either sweet or common sudan grass. In addition, Piper is lowest in livestock poisoning danger, high in leaf disease resistance, and makes the best regrowth in September of varieties tested.

2. Piper has straw to reddish-black seeds and is easily distinguished from common sudan, which is orange colored.

3. Sweet and common sudan are about equal in yield and are satisfactory for use until enough seed of Piper is available.

4. Seed of Piper may be two to five cents higher per pound than common or sweet sudan grass but this small difference in seed price amounting to 40 cents to $1 per acre should give farmers the best variety available at present.

Although the use of a superior variety like Piper will increase sudan grass yields, maximum yields will not be obtained unless the following cultural and climatic recommendations are followed.

Grow sudan grass on land which is well prepared and fertile enough to grow good corn.

Sudan grass requires a lot of nitrogen. Use 200 pounds 10-10-10 fertilizer per acre when seeding in addition to manure or 350 pounds of 10-10-10 on nonmanured land to supply necessary nitrogen, phosphorus and potash.

Seed about one inch deep with a grain drill set to sow two pecks of wheat. This will seed from 20 to 25 pounds per acre.

Livestock should not be turned into sudan grass until the plants are 18 inches tall, which is usually about six weeks after seeding. There should be no danger of pasturing sudan after it is this tall since tests show that the hydrocyanic acid is low in the plant when the plant reaches a height of 18 inches.

Sudan should normally give about 30 cow days of pasture in July, 45 in August, 30 in September and 10 in October. This is a total of 115 cow days of pasture during the hot, dry months.

Sudan grass should not be grazed after the first killing frost since the small shoots coming up after the frost may be poisonous to livestock.

Range Those Pullets!

Rotation of ranges helps control worms . . .

Condensed from Poultry Tribune

Carl O. Dossin

Pennsylvania State College

"MY BIRDS are laying only 30 per cent, but according to the chart my feed company gave me, they are eating enough feed to be doing 60 per cent. What do you suppose is wrong?

"Can you help me find out why my hatcheryman is complaining about the hatchability my eggs are giving him and also the quality of chicks?"

Those are two questions that were asked occasionally a few years ago. This past year in the east, those two questions were asked many times.

Poultrymen raising the questions had too many thin birds in their flocks. There is no doubt that a heavy infestation of round worms was the cause of low production, poor hatchability and many cull chicks at hatching time.

It is a problem as to why worms have become more serious in the east the past few years. Poultrymen may be growing more birds on the same number of acres of range. Many poultrymen have been brooding their chicks on old litter. There is also the possibility that worm infestations occur in cycles, and that this may be the beginning of a new cycle.

Years ago when poultrymen rotated their ranges every year or two, very little trouble was experienced from worms. During the years that the ground was not used for ranges, cultivated crops were grown.

Poultrymen who have had trouble from round worms should consider seriously getting back to a range rotation program. Thought should be given to establishing new poultry ranges. A good poultry range will lessen the disease and parasite problem. It will also provide an abundance of feed which will help to reduce the feed bill.

A poultry range must stand severe punishment, since as many as 1,000 pullets are often ranged on one acre. The quality of the range should determine the number of pullets that are reared to

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Mount Morris, Illinois

the acre, but most good ranges can handle 500 birds per acre. To withstand this heavy population, a range seed mixture should be made up of grasses and clovers that can stand rough treatment. Ladino and White Dutch clovers along with bluegrass in a mixture have given excellent results.

Mowing is probably the most important operation in maintaining an abundant supply of fresh succulent forage in a weed-free condition. The mower should be set to cut the forage three to four inches from the ground. Frequent mowing will minimize the formation of seed heads of grasses which are low in feed value and palatability. During the fast growing seasons, the ranges should be mowed at least once a month. If the range is used for several consecutive years, it should be fertilized with superphosphate.

Some poultrymen because of a limited amount of land, parasite problems, labor troubles, or because of losses from predatory animals are raising their pullets in complete confinement. The newer poultry rations make it possible to raise good pullets in confinement, provided the birds are given plenty of floor space.

There are many who raise their birds on range, but do not take full advantage of the benefits. Some poultrymen will set two or three shelters beside each other to simplify the feeding and watering problem. When this is done, there is a heavy concentration of birds in a very limited area. This will destroy the forage and will leave a large bare spot which creates conditions for the development of diseases and parasites.

If possible, locate shelters at least 100 feet apart. Feeders and fountains can be so located that they can serve two shelters.

Many pullets are raised each year on range without the benefit of mash hoppers. When this program is followed, pellets are fed on the ground. Frequently grain drills are adjusted so that they can be used to distribute the pellets. Grain also is scattered in the same manner. The pellets or scratch feed is distributed over a new area each day. In rainy weather the pellet feeding is omitted because the pellets soon disintegrate after getting wet. Skipping a few feedings of pellets will not hurt the birds. Extra scratch feed is usually given on those days.

To simplify labor problems, some poultrymen who have automatic or large barrel type waterers are eliminating all Sunday feeding on range. Some will fill the hoppers Saturday afternoon to provide feed for the birds over Sunday, but others let the birds go one day a week without concentrated feeds. On these days, the birds will range farther and eat more grasses and bugs.

If feeders are used, they should be moved frequently to avoid bare spots. If possible, also move the drinking fountains at regular intervals. In the past it was suggested that the range shelters be moved several times during the summer. This practice increased the number of bare spots on the range. The practice followed today is to move the shelters just far enough to clean up under them and then return them to their original location.

The practice of rotation of poultry ranges several years ago was very successful in controlling worm problems.

Price Support Given for 1953 Crop Corn

The U.S.D.A. has announced that the national average level of price support for 1953 crop corn will be $1.58 per bushel.

This average level of support is the minimum, representing 90 per cent of the parity price for corn as of February 15, 1953. It will be revised upward if 90 per cent of parity as of the beginning of the next marketing year for corn—October 1, 1953—is higher than the price just announced. In no event, however, will the national average support level be lower than the announced minimum.

The average level of support for corn is announced at this time in accordance with a legislative requirement that, insofar as practicable, the levels of support for field crops be announced in advance of the planting season, USDA officials point out. Legislation also requires that for the 1953 and 1954 crops of the "basic" commodities —which includes corn—the level of support shall be 90 per cent of parity.

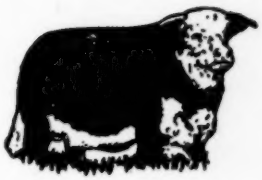
The price support program for the 1953 crop of corn will be carried out through Commodity Credit Corporation loans and purchase agreements, as in the current and previous years.

The national average support price for 1952 crop corn, now being marketed, is $1.60 a bushel, which is 90 per cent of the parity price for corn as of October 1, 1952, the beginning of the current marketing year.

Dairy product cold storage holdings are increasing in a period where they are normally declining. End of February cold storage holdings were 100.8 million pounds of butter as compared with 7.9 million pounds last year and 185.5 million pounds of cheese as compared with 42.5 million pounds last year.

Best Yet for Beef

Two new supplements — "Iowa 1" and "Iowa 2" — make cheaper gains than any you have heard about, possibly including Purdue A



Condensed from Farm Journal

Ray Anderson

YOU'VE heard a lot about protein supplements for beef cattle—from the old mineral and soybean meal mixtures to "Supplement A," and some others lately. Now here are two new ones that look like the best yet, in some respects. They are called "Iowa Supplement 1," and "Iowa Supplement 2," and were developed at Iowa State college.

With these new supplements you can:

(1.) Put on beef gains 20 per cent cheaper than with old rations.

(2.) Make from 50 to 70 per cent more beef per acre of land.

(3.) Save hay by feeding a ration high in chopped corn stalks or corn cobs.

(4.) Use urea as a substitute for some of the oil meal, which is usually scarce; thus saving more of the latter for hogs and chickens.

In tests so far, the Iowa Supplements made even more beef per acre, and at lower costs, than Purdue Supplement A.

In a 106 day test at Iowa State college, steers fed *chopped corn stalks,* and either Iowa Supplement 1 or Iowa Supplement 2, put on each pound of gain for a feed cost of 20.2 and 20.9 cents. Purdue's Supplement A did it for 21.2 cents. Steers on an ordinary Corn Belt ration of corn, hay, soybean meal, and a mineral mixture, needed 26.8 cents worth of feed per pound of gain.

The feed cost for steers on Supplement 2 and *ground corn cobs* was 17.5 cents per pound of gain —with hay it was 25.3 cents. (No test was run on No. 1 with corn cobs and hay.)

The new Iowa Supplements really stand out in the amount of beef they make per acre of land. Using *corn stalks* and Supplement 1, an acre of 75 bushel corn land

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Philadelphia, Pennsylvania

will grow enough feed (grain, hay and supplement) to make 627 pounds of beef. This compares with only 363 pounds for the corn-soybean meal-mineral ration; 537 pounds with Supplement 2 and corn stalks; 566 pounds with Supplement 2 and corn cobs; 525 pounds with Purdue Supplement A and corn stalks; and 297 pounds with Supplement 2 and hay.

The steers on the Purdue Supplement did gain three pounds a month faster, and used less corn. More of their gains come from the Purdue Supplement itself, which is high in soybean oil meal.

A ton of Iowa Supplement 1 cost $105 at July 1952 prices. It contains 1,200 pounds of linseed oilmeal, 458 pounds of urea feed, 240 of bone meal, 64 of iodized salt, 16 of trace minerals, 16 of vitamin A and D oil, and 6 of live yeast feed.

Iowa Supplement 2 is cheaper —$89 a ton. It is a mixture of 666 pounds of linseed meal, 666 of distillers' grains, 268 of cane molasses, 214 of urea feed, 134 of bone meal, 36 of iodized salt, 8 of trace elements, and 8 of vitamin A and D oil.

These mixtures have too much urea in them to feed straight. They should be cut down with corn until the urea is no higher than five percent of the concentrate. It can be done by mixing five pounds of cracked corn to each pound of Supplement 1; and two and one-half pounds of cracked corn to each pound of Supplement 2. Because of the difficult mixing job—and because the ingredients in these two new supplements aren't readily available — commercial feed men will probably have to mix and sell this supplement.

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Water added to dry grain cuts eating time for cattle in half, reports Dr. C. F. Huffman, Michigan dairy research specialist; it makes faster milking, greater milk production and more contented cows.

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(Purdue Supplement costs $97 a ton, and contains 1,286 pounds of soybean oilmeal, 572 pounds of 45 per cent molasses feed, 102 of bone meal, 34 of iodized salt, and 6 of vitamin A and D oil.)

The Iowa steers were full-fed chopped corn stalks, and ate about 10 pounds a day on a dry matter basis. The steers on corn cobs ate about 11 pounds a day of the corn cobs. The steers on the high-hay ration ate 17 pounds of it a day.

Two pounds of mixed hay a day was fed with the corn stalks and the cobs. The cattle needed the hay to feed the bacteria in their rumens when on a low quality, high roughage diet.

Fescue in Rows — Clover in Middles

Try this if you can't maintain clover and fescue in broadcast stands . . .

Condensed from Soil Conservation

Paul Tabor

TALL fescue and Ladino clover make a good soil conserving, forage producing team when they work together.

A good farmer can keep the two crops in line by proper management. This may mean extra nitrogen fertilizer when the grass languishes, or extra phosphate and potash if the clover needs help. It may mean moderately close grazing or cutting for hay or silage to prevent lodging and disease troubles in wet weather, or it may mean lower rates of seed per acre to prevent overcrowding.

If the usual hazards are intensified by drought and heat, another method may be necessary. When Ladino clover burns out during excessive summer drought, there isn't much chance of reestablishment in a moderate to dense stand of tall fescue. Experience on Soil Conservation nurseries in the southeast indicates the solution may be the planting of fescue in contour rows 30 to 36 inches apart with clover in the middles.

The continued persistence of tall fescue in rows with Ladino clover in middles is a by-product discovery. Most of the SCS nurseries in the southeast have grown Kentucky 31 fescue in contour rows 30 to 36 inches apart, using about five pounds of seed per acre. This spacing and seeding rate was near optimum for two or three years. After this time, the grass became crowded in the row and needed large amounts of nitrogen and minerals for seed production.

The use of legumes in the middles to furnish part of the nitrogen was suggested and tried. It didn't work well on upland for seed production, because two crops pulled too heavily on the soil-water supply, and the vetches and winter peas tangled the seed heads of the grass. Ladino and big white clover disappeared in broadcast seedings with fescue.

Reprinted from Soil Conservation
Washington, D. C.

In one plot at the Sandy Level Nursery, Ladino clover has pushed out the fescue in broadcast stands. It happened quickly before the cause could be determined. In other similar situations, a leaf blotch disease, *Rhizoctonia solani,* attacks the fescue plants during periods of hot damp weather. Fortunately the clover is resistant. When the dense growth of clover-grass falls down, an ideal condition is provided for the disease.

On rich lowland at the Chapel Hill, North Carolina, nursery a mixed seeding of Kentucky 31-Ladino clover failed because the grass shaded out the clover. The management used was favorable for fescue seed production. The grass plants used the nitrogen left in the soil by the clover and grew larger and taller than in other fields on the nursery.

Grass rows and clover middles do not provide so firm a footing as a broadcast mixture. More selective grazing is also permitted, which may result in overuse of the clover. Lower yields may result from close continuous grazing with the fescue plants kept too small for optimum growth. Any farmer will hesitate to plunge into so many disadvantages if he can maintain fescue and clover in broadcast stands or in narrow rows.

Planting tall fescue in rather wide contour rows with Ladino or big white clover in the middles appears to be the surest way of keeping both. It may be valuable where the hazards of heat and drought are rather high. Less seed will be required per acre. More care in grazing will be needed. The fescue plants should be allowed to grow bigger than in a broadcast pasture.

Farm Land Prices Reach New Peak

Prices for Minnesota farm land reached a new high in 1952, Minnesota agricultural economists reported. Based on a survey of 400 farm real estate brokers scattered throughout the state, the report shows that the average price of farm land in the state in June, 1952, was $107 per acre, compared with the previous high of $104 in the 1920-'21 period. Only in a few areas did values fail to top that peak.

Along with the new average price peak, the economists also found a decline in the farm land market activity during the past year. Farm real estate brokers reported 34 per cent fewer farms sold in the state as a whole during the first five months of 1952 than during the corresponding period in 1951. *University of Minnesota*

A New Combination

Grass-Eating Livestock and Poultry

Horses and heifers go well with hens and turkeys . . .

Condensed from New England Homestead

William Gilman

THE farm that switches to poultry often finds itself with the familiar problem of more space than it needs—those surplus acres which can quickly degenerate into rundown brushland.

As an antidote, several chicken and turkey farmers along the Vermont-New York state line have kept their specialty, which is poultry, but have also added a "cash crop" of animals on the side. This is done by turning their extra acres into profitable grasslands and it's a practical solution because it fits into the program of providing outdoor range for their birds.

Selling hay, as such, they have found, can be a headache due to fluctuating market demands depending on how the weather treats their region's hay crop. Often, even good standing hay goes begging.

The solution worked out by these poultrymen is a parlay—they "sell" the hay to their own grass eating animals. In some cases, the final animal product which they market is milk. In others, it's a specialty like bred heifers—or even horses.

Meanwhile, their poultry manure is providing valuable meadow fertility instead of being given away free for the cleaning, or sold at give-away prices. And for those who range their birds, the meadows provide plenty of elbow room for a disease prevention rotation scheme so that birds need not pasture the same plot year after year.

For example, near Arlington, Vermont, veteran poultryman Keynith Knapp does his main farming with a flock of around 3,000 hens whose eggs go to the hatching-egg market. Originally,

Reprinted by permission from New England Homestead
Springfield, Massachusetts

he was a day laborer. Twenty years ago, he started in poultry with 20 White Leghorns and one rooster. Now he has a prosperous, modern setup revolving around New Hampshires, and 230 acres.

But he gives part of the credit to his "hay burners," who help consume both growing grass and baled hay. At first, he tried raising draft horses as a cash crop. But he had grief trying to sell them—he couldn't buck the modern farmer's preference for a tractor over a team of horses.

So he switched to a specialty. In the past eight years, he has concentrated on Morgan horses—a versatile breed still in demand for work, riding pleasure and showmanship. And he has had no trouble at all selling 30 colts and yearlings. All told, Knapp's grassland feeds a herd of around a dozen Morgans usually on the place, counting a stallion, brood mares and colts.

The top price he has received for an animal was the $1,500 he got when he sold his prize winning, three year old stallion Black Sambo, after breeding him to Ambition, the stallion's mother. Now 22 years old, she has given Knapp a colt every year since he bought her as a 14 year old. His present senior stallion is handsome Scott's Hero, an 11 year old that Knapp has owned the past three years.

More often, the cash crop is bred heifers. This is the method followed by F. C. Baker's poultry farm near South Shaftsbury, Vermont. The farm's main business revolves around a laying flock of 3,500 hens who are given the best of specialized care.

But the farm also raises around 150 tons a year of high quality alfalfa and grasses. When selling the hay as such became bothersome, Baker decided to market it in the form of bred heifers. His birds are now backed up by a herd of around 75 young stock. He buys the animals as calves and they are later pasture-bred.

The same method also works with confinement-reared turkeys. Near North Bennington, Vermont, Clifford F. Turner grows 1,200 turkeys a year for a quality market. Selling his farm's hay at a profit wasn't easy, he recalls,

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The farmer received 48 cents on every dollar the consumer paid for retail farm products in 1952. In 1951 the farmer got 50 cents, and 1945 — the high point—he received 54 cents.

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and he didn't want to see most of his 76 acres end up as weeds and brush.

The "customers" for his grass now are the dozen bred heifers that he markets each year. He says it's easy: "Good heifers sell like hotcakes."

He buys only high grade calves

and breeds them in their second summer to his registered bull. They are later sold just before, or after freshening. During winter, they feed on what they need of the 60 tons of alfalfa-clover-timothy baled hay which Turner has cut the previous summer. All told, he has 35 acres each of meadow and pasture.

Turner figures that his turkey pens provide around 50 manure spreader loads which he uses for top-dressing in spring. And from his cattle, he gets another 60 loads of manure for the grassland. He adds lime and superphosphate direct to each load. As a result, he reports, "the hay grows like mad."

Another solution is to pasture birds and animals together, with hayland providing winter feed for the animals, as it is done on the

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It takes 5,000 gallons of water to produce a bushel of corn, 100 gallons to produce one pound of cotton, and 1,300 gallons to produce a single pound of beef.

* * *

farm run by Earl Fowler and his son, Robert, near Manchester, Vermont. The growing range for their young pullets usually looks like a nicely carpeted golf green. That's due to the small flock of sheep which keep it mowed properly, and to the fertilizer which they and the pullets supply.

Short, succulent, grassy shoots of that kind — rich in proteins, vitamins and minerals — mean money saved on the healthy 2,500 replacement birds that the Fowlers raise each year. Inasmuch as good pasture is known to net a saving of four pounds grain per

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Farmers now do 17 per cent less work and get 45 per cent more output from their land than they did in the early 1930's.

* * *

growing bird, the Fowlers figure on five tons saved annually.

As for the two dozen Suffolk ewes and their crop of around 30 dressed lambs, these poultrymen say the old rule still holds true. The wool pays costs, and the lambs represent profit.

Of course, milch cows can also be used to back up the poultry flock. Across the Vermont line, in Washington County, New York, the 3,500 turkeys that are grown annually by Hans Izaksen & Son at their farm near Cambridge get help from a 17 milker dairy herd which neatly solves the problem of what to do with hayland. A three year rotation plan is practiced here. After being well fertilized by the turkeys one season, a range is planted to corn the next year, and then seeded back again.

Land Ownership in Iran

In this country, giving the land to the men who till it is not easy . . .

Condensed from Foreign Agriculture

Franklin S. Harris

HUNGER for land is one of the most obvious wants in Iran, as it is in almost all parts of the Orient. Sons of peasant farmers—most of the young men—do not know how to make a living in any way expect by tilling the soil; and they have few opportunities to learn, for off the farm jobs are hard to find.

In populous areas, where the soil is fertile, the competition for land is so great that the acreage available to each farmer tends to grow smaller and smaller, and landowners gain a tremendous bargaining power out of this ever increasing land hunger.

This hunger is not necessarily a desire for outright ownership, for few peasants who cultivate the land actually own it in this part of the world. If they were required to purchase the land they till, they would be unable to be farmers at all, for they have relatively little capital. They can, however, carry on farming operations under some system of share cropping. The economic condition of a farmer may be judged to to a considerable extent by the degree of his independence in matters of rentals, tenures, and ownership.

The system of land distribution in Iran is the result of a complex interworking of political, social, economic, religious, racial and climatic forces of a fundamental character over many hundreds of years.

The practice of share cropping is so common in Iran because certain types of farming require large outlays of cash and most Iranian peasants have little working capital. This kind of agriculture, therefore, can only be carried out under a landlord. In Kerman, for example, water must be brought long distances from the mountains to the farms. The water is carried in underground canals, called ghanats, which are expensive to build and to main-

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Washington, D. C.

tain.

Other types of farming in Iran are suited to the financial limitations of the small farmer. The pastoral agriculture of the mountainous area north of Bandar Abbas is one such type. In this area, peasants get their water from the mountain streams, own the land they cultivate, and graze their sheep and cattle on the open mountainsides. In Yezd, a prosperous agricultural section in central Iran, small independent farmers also predominate. There are some large landowners in the area, but most of them live on their farms. Here, field crops are produced, and farmers band together to construct and maintain the ghanats.

Dividing the Income

Rental practices in Iran are as varied as the types of agriculture. In most areas, however, rent is paid in kind, and often the peasant pays the landowner not only part of the crop but other dues as well—a definite amount of clarified fat or firewood, for example.

For many years, attempts have been made to standardize rents and the division of crops. At times, commissions have been set up. Many proposals have been made, but no laws have been enacted.

The division of profits is a matter of bargaining between the landlord and the peasant. In certain regions — those producing rice, for example—rather uniform rents have been established. In some cases they apply over a rather large area. On the other hand, great variations in rentals are found, depending on all the factors that enter into farming operations, as well as on tradition.

When rent is paid in kind, five basic factors are usually taken into consideration in calculating the division of the crop. These factors are land, water, seed, labor and power. The harvest is divided into five portions, one being assigned to each of these factors. The value given each factor varies, of course, with the type of agriculture. Under dry farming, where irrigation water is not required, the harvest may be divided into three or four portions. But when the landlord furnishes land and water and possibly seed or power, the crop is often divided equally between the landlord and the farmer. And, with such crops as sugar beets that require a great deal of hand labor, much weight is given to the labor factor. When livestock is used, another element is introduced into the complex situation.

Whether rentals are paid in kind or in cash depends on the crop produced. In such fruit growing areas as Azerbaijan and Khurasan, rentals are paid in cash —a certain amount per tree—for payment in kind would be inconvenient for both grower and land-

lord. In practically all parts of the country where grain is the principal crop, the absentee landlord gets a portion of the crop, which he can market when it is most advantageous.

Difficulty of Changing System

Since Iran's ownership and tenure systems have been evolved through long years of experience, much difficulty would be encountered in changing them. The government has at times attempted to transfer landownership to the peasants by decree, but these efforts have not been successful. An example is found in an area in Seistan in the eastern part of Iran.

This area was once considered public domain, various parts of which were rented to tribal leaders, who managed the villages and permitted the peasants who actually tilled the land to retain a portion of the crops. Thus peasants made a contribution directly to the tribal leaders, who in turn contributed part of their income to the government, which was assumed to be the real owner of the land.

Under Reza Shah, in the early 1930's, a new system supervised by the Ministry of Finance was introduced for this part of Seistan. Under this plan, most of the lands were so distributed that the government dealt directly with the peasants.

In this distribution each peasant was awarded as much land as could profitably be sown with 660 pounds of wheat or barley. This was approximately 10 acres. The new distribution system was in operation for four or five years, but from the beginning it seemed doomed to failure. The land gradually reverted to the control of the tribal leaders and other powerful landlords.

Some of the reasons for the failure of the plan are as follows:

1. The peasants were not accustomed to managing their own affairs; they had always depended on the landlords for direction. They failed to maintain the irrigation system, for instance, because the individual peasants had never worked out a plan of cooperation among themselves.

2. The individual farmer lacked capital for improvements and living expenses, let alone for buying the land.

3. There was no adequate system for selling the products of the single farmer.

During the late 1930's, the Ministry of Agriculture made another attempt at land distribution in Seistan. This time the ministry undertook to allot land to individuals who seemed able to operate it, because they had some capital, experience, etc. The allotment was usually large, consisting of most of a village.

Since these awards were frequently made to outside persons,

the tribal leaders were dissatisfied. This discontent led to contention that gradually brought into operation the present system, which is the one that long prevailed. Most of the land is owned by large landlords, including tribal leaders. Very little is now owned by the peasants who till it.

The Future

After examining the complex pattern of land distribution and tenure that exists in Iran, the investigator wonders what might be expected to happen in this country that has set itself to improve its national welfare.

Desirable as land ownership may be for the peasant and the country, however, certain difficulties are encountered in bringing this about in Iran. The two greatest difficulties are the shortage of capital on the part of a peasant-farmer and his lack of experience in managing his own farming enterprise. He has been so accustomed to having a landlord furnish money to cover his financial needs and give general direction to his business transactions that he is not prepared financially or psychologically to carry the load of conducting an independent farming operation.

For these reasons, the transfer of the land from the landlord class to the farmer class will require years of education and considerable adjustment in the financial structure. This adjustment might come through co-operatives or other devices that will enable the peasants gradually to build up working capital by setting aside part of their earnings.

In countries such as the United States, with long years of experience in individual ownership of the farms, it is easier for farmers without land to advance from the tenant to the owner class. It is done through personal initiative, regular credit sources and by making credit available through special land banks or co-operatives. Many difficulties have been encountered in this transfer, however, even under the favorable conditions that exist here in the United States.

The forward-looking plan of the Shah in which he hopes to aid peasants to become landowners may well be a proving ground for a new economic order among the farming classes of Iran. Certain tribal leaders are also giving consideration to plans for making the lot of their farmers more secure and for raising their standard of living.

Certainly an evolution of a more dynamic rural economy is much to be desired in Iran, and this change can best be accomplished by an evolutionary, unified growth in that direction.

Is Farm Parity Obsolete?

New machinery and methods bring more and more food production with less labor . . . and question soundness of a formula based on 1910-1914 conditions.

Condensed from The Wall Street Journal

Ray Vicker

ELMER PAUL, a lanky Iowa cattle fattener with a 480 acre farm, recently bought a forage feeder. It mixes his corn and ensilage automatically, then sends it by conveyor to his 240 head of yearlings. Two men do in three hours the job that used to take them a day.

R. W. Bartine, a mechanized farmer with a 400 acre place near Clemens, c o p p e d Iowa's corn growing championship last year. His 170 bushels to the acre compared with the state's 64 bushel average.

Stop at most any farm in the Corn Belt and you'll hear similar tales of more and more food production with less and less man-hours of work.

What's been happening through mechanization and modernization in recent years has been happening all across the country—from Maine's potato patches to California's orange groves. Powerful tractors and multiple plows, corn and cotton pickers, automatic hay balers, electric milkers and rafts of other labor saving devices are commonplace.

Across the Land

Meanwhile, new advances in the physical and biological sciences are scoring big gains in yields. Hybrid seeds hike corn production. Pigs fatten faster with antibiotics. Chemical fertilizers pep up tired land.

Agriculture Department statistics tell the results of this revolution. Back in 1910-1914, era of the kerosene lamp, the wheat

Reprinted by permission from The Wall Street Journal
Chicago 90, Illinois

farmer labored 106 hours to produce 100 bushels. Today he can grow and harvest 320 bushels with the same work. The corn farmer who put in 135 hours for every 100 bushels now can produce 245 bushels. The rice grower who sweated 154 hours for every 100 bushels now gets 275 bushels.

Tied to an Era

That period of 1910 to 1914 is very much in the farmer's mind today. It's the period on which the federal government's whole farm price support program is based. Iowa corn growers, as farmers elsewhere, know that program is being put to a severe test right at the beginning of the Eisenhower administration. Big crops have pushed prices down to levels where the government is supporting a large portion of the agricultural industry through loans and purchases.

Key to this support program is the "parity" system. As the Department of Agriculture explains it: "The parity price of an individual farm commodity is a standard for measuring the purchasing power of that commodity in relation to prices of goods and services during a definite base period." In other words, a bushel of corn today ought to buy for the farmer as much as it did in 1910-1914.

The government doesn't guarantee the farmer parity, but it does promise the grower of corn, cotton, wheat, rice, tobacco, peanuts and specific other commodities 90 per cent of parity.

But today the average farmer gets 2.4 bushels of corn for as much as brought him one bushel in 1910-1914. Many farmers, in the forefront of the agricultural revolution, do far better. Mr. Bartine's record breaking yield in Iowa last year was more than four times the national average of just above 40 bushels to the acre.

Of course, it takes a lot of machinery to farm like that. The average Iowa farmer today reckons he has a depreciated investment of around $7,000 in machines. Replacement cost probably would be double that figure, and it isn't unusual to find a man running a 400 acre farm with a $50 an acre investment in machinery.

Formula Obsolete?

Statistics such as these help explain why some farm leaders say the parity price support formula is obsolete, that it should be revised to guard against disaster rather than guarantee high prices on surpluses.

"There is a real need for a sound farm program," says Allan B. Kline, president of the American Farm Bureau, Chicago. "In a period of declining prices the farmer is caught in a squeeze since his costs do not decline with his income. He needs some help in such situations."

Then he warns: "If the government is going to guarantee high prices, it must guarantee distribution at that price for the program to succeed. Otherwise produce will back up on farms and in government warehouses."

Other farm leaders warn that if every agricultural commodity from oranges to walnuts and from potatoes to beef were placed under parity, even at 90 per cent, the bill to taxpayers would be so high that a wave of protests might force junking of the entire program. They emphasize that consumers, today, represent 85 per cent of the voting population, while farmers represent only 15 per cent.

Oranges were selling for an average $1.36 a box on February 15 whereas the estimated parity price was $3.24. If supports were placed under oranges based on parity, the government would have to pay more than double the market price. Oranges would be going into government warehouses while consumers went begging for the fruit.

Grapefruit on February 15 were selling for 68 cents a box while the parity price was $1.77.

"Ridiculous"

"The parity price on many commodities is ridiculous unless modernized," says one Iowa farm association official. "Many citrus fruit and vegetable growers would make millionaires of themselves if guaranteed parity on the obsolete 1914 relationship."

Yet, many farmers are fearful that suggestions for revision of the parity system may lead to junking of the entire program. And few want that. Farmers remember the dark days of the depression when they were lucky enough to have money in their denims to buy seed come spring. They feel justified in having a floor under agricultural prices which would prevent any repetition of those trying times.

Meanwhile, as declining farm prices focus attention on the parity question, researchers are developing new seeds and fertilizers to hike production even higher. Machinery manufacturers compete with each other to develop better equipment to permit handling that greater output with less labor.

At Iowa State college, in Ames, they are proud of a new oats seed, the Clintafe variety, developed by mating a Clinton to a Santa Fe seed. It yields eight bushels to the acre more than its parent Clinton and it is resistant to diseases which had been taking a toll of oats.

When farmers had trouble with corn blowing down in fields during heavy gales, seed researchers went to work. They found a long rooted variety of corn, crossed it with a heavy producer and gave farmers a hybrid which stands upright through fall gales.

When researchers tackled popcorn seed, they came up with a hybrid which regularly pops to a size 35 times bigger than the kernel. Older corn had been popping 22 to 26 times kernel size. Moreover, the hybrid yields 30 per cent to 50 per cent more per acre.

Research Helps

Better breeding of dairy cows has paid off with a hike in milk production per cow from 4,403 pounds in 1935 to 5,192 pounds today. The humble hen, stimulated by vitamin diets and improved breeding, hiked her output from an average 100 to 137 eggs a year in the same period.

Statistics show the trend in machinery. Today there are 4.2 million tractors on farms, against 1.7 million in 1941. The number of milking machines jumped from 210,000 to 686,000. Combines increased from 225,000 to 887,000. Mechanical corn pickers on farms climbed from 120,000 to 588,000.

"I sold my last team of horses in 1949," says Ed Honnold, who farms 200 acres near Slater, Iowa. "And I haven't found anything yet that my two tractors couldn"t do better."

A neighboring farmer has $47.50 an acre tied up in machinery and equipment, compared with $10.75 in 1941. But he runs his 240 acre place alone, whereas he used to feel pinched at times with two hired hands.

Harvesting corn, he uses a mechanical picker and gets 1,000 bushels in the time a hand picker would get 100. When he puts up his hay, he uses a mechanical baler and makes around 10 tons an hour against the two tons a crew of five men baled with an old stationary baler.

It isn't only in the field that you see machines at work. Today, more than 84 per cent of farms have electricity, against only 11 per cent in 1935. This has opened the door to countless gadgets wired to electrical motors.

Makes His Own Weather

Oliver Jones, who operates a 358 acre Iowa corn farm, illustrates the trend. Of his more than a score of pieces of major equipment, he is proudest of his electric corn dryer. Installed at the base of a steel corn storage bin, it is a fan driven heating unit which circulates warm air through the bin.

"I can make my own weather with that," says Mr. Jones. "It used to be if we had a wet fall and my corn got wet, I'd lose some of it the first frost and would have to sell the rest in a hurry before it all spoiled. Now I can dry it out and keep it for years if I have to."

Over at Cole, Iowa, L. H. Wengert, a stout, jovial dairyman, shows how far along things have come since you hand milked Bessie. He has just installed an elec-

tric "milking parlor," a spotless edifice of cement, steel cribbing and stainless steel piping, with fluorescent lighting and thermostatic control heating.

Mr. Wengert stands in a central control pit with two cow stalls on each side. He pulls a rope, doors open and four cows amble in from the adjacent barn. Once inside, the gates close automatically. A hired hand quickly washes the udders, clamps on milking machines and when Mr. Wengert presses a button the suction starts, conveying the milk through pipes to the cooler. A pull on a lever drops an automatically weighed feed mixture into a bowl under each cow's nose. The animals are on an incentive pay basis: The amount of feed is computed according to each cow's production of milk.

"We like to do things the laziest way we can," explains farmer Wengert. "Currently we are doing a $1,000 a month volume with 19 milkers, but with the new parlor we can handle a herd of 40 cows."

So he's expanding his herd, aiming for a higher output.

Tales of expanding production with the same amount or less labor are heard wherever you go in agriculture. In 1870, the average farm worker had 1.6 horsepower to help him, all of it the four footed type. In 1920, he had 5.3 horsepower. By 1940, the ratio had climbed to 27.8 and today it's around 45 horsepower per man, nearly all of it mechanical.

Labor on farms declined from 12 million men in the 1910-1914 period to 11.6 million in 1940 and about 9.5 million today. Yet farm production in 1952 was a third higher than in 1940 and nearly double that of 1910-1914.

Of course, the population increase — from around 93 million in 1912 to 157 million souls today —has absorbed a lot of that extra food.

And the population still is increasing at a 2.25 million annual rate. That's one reason why some farm leaders are contending emphasis in farm assistance programs should be shifted to promoting demand rather than on fixing prices.

"There are plenty of opportunities for developing new markets," says farmer Wengert. "That's the best way to take care of surpluses. When you set up a system of rigid price supports, produce backs up on the farm or in government warehouses."

Other farmers like Mr. Wengert add, however, that recognition should be given to the fact that farm prices traditionally fall at a faster rate than farm costs during any decline.

"After all," says one Ames, Iowa, farmer: "If you let a depression develop in agriculture, you'll have a depression all over."

BEEF CATTLE

Will Feeder Cattle Pay .....Oct., 1952
Make Beef for 14 Cents .....Oct., 1952
History of Beef Cattle .....Nov., 1952
Winter Feeding Beef Cattle ..Dec., 1952
Breed Productive Beef Cattle Feb., 1953
Blood Analysis,
Growth Secrets .....Feb., 1953
Record By Weight .....Mar., 1953
How Bob Smith Makes Beef..Apr., 1953
Feeding Purdue Supp. A.....Apr., 1953

CONSERVATION

A Valley Is Reclaimed .....Oct., 1952
Earth Takes Big Drink .....Oct., 1952
Clear Pond Water .....Nov., 1952
Drained $75,000 Ranch .....Dec., 1952
Should Cattle Graze Woodlot .Dec., 1952
What He Did on $25 Land ...Feb., 1953
High Yields, Well-Fed Soils..Mar., 1953
Worst Farm in County .....Mar., 1953
How Muellers Conserve Soil .Mar., 1953
Place to Starve On.....Apr., 1953

CROPS

Red Clover Comes Back .....July, 1952
Why I Believe
in Conservation .....Sept., 1952
Costs to Harvest Grass Silage.Oct., 1952
Male Sterile Corn .....Dec., 1952
Corn Following Corn .....Jan., 1953
Your Corn Harvest .....Jan., 1953
New Way Alfalfa Seed .....Jan., 1953
Rambling Alfalfa .....Feb., 1953
Cotton, Wonder Fiber .....Mar., 1953
Wide, Narrow Corn Rows....Apr., 1953

DAIRY CATTLE

Herd Sire Problem .....July, 1952
Improve Butterfat Test .....July, 1952
Cut Chore Time .....July, 1952
Bloat, an Old Trouble .....Sept., 1952
Science Looks at the Cow ...Sept., 1952
Our Sacred Cows .....Sept., 1952
New Sanitizer for
Milking Machines .....Sept., 1952
What's Ahead for Dairymen?.Oct., 1952
New Cure for Trichomoniasis.Oct., 1952
Planning for Dairy Profits ..Oct., 1952
New Milking Unit .....Nov., 1952
What Makes Good
Dairy Incomes .....Nov., 1952
Healthy Calves
With Roughage .....Nov., 1952
Antibiotics for
Dairy Animals .....Nov., 1952
Take Advantage of Architecture
of the Cow .....Oct., 1952
Red Dane Dairymen .....Dec., 1952
Research Improves Dairying .Dec., 1952
Box Score,
Artificial Breeding .....Jan., 1953
Loose Housing .....Jan., 1953
Ketosis, Latest Research ....Jan., 1953
Eight Breeding Tools .....Feb., 1953
Dairy Type Classification ...Feb., 1953
How Smart Is a Cow .....Mar., 1953
Forage and Milk Production Mar., 1953
Good-By Milk Can .....Mar., 1953
Roughage and
Low-Cost Milk .....Mar., 1953
Profits and Herd Health .....Mar., 1953
Flavor of Milk.....Apr., 1953
Electronic Cow Testing.....Apr., 1953
Practical Calf Dehorner.....Apr., 1953
600 Lb. Butterfat Herd.....Apr., 1953
Blood Type Studies.....Apr., 1953

FARM BUILDINGS

Top-of-Ground Silos .....Sept., 1952
Pole Type Poultry Shelter ...Oct., 1952
Heat Pumps for Farm Homes Nov., 1952
Poultry House Ventilation ...Nov., 1952
Saving Sweat in Silo .....Nov., 1952
Lightning Protection .....Feb., 1953

FARM MANAGEMENT

Don't Buy a Fooler Farm ...July, 1952
Lease That Will Last .....July, 1952
Air Service for Farmers .....Sept., 1952
Farm Fire First Aid .....Sept., 1952
$600 Into 2,00 Acres .....Sept., 1952
Road to Efficient Farming ..Sept., 1952
All-Risk Crop Insurance .....Oct., 1952
Biggest Cross-Roads Bank ...Oct., 1952
Can You Pump Your
Neighbor Dry? .....Nov., 1952
Insurance for Farmers .....Nov., 1952
Advice at Budget Price .....Dec., 1952
Guideposts for Farm Bus. ...Jan., 1953
Before You Buy a Farm .....Jan., 1953
1952 Income Tax .....Jan., 1953
Plan to Pay Less Tax .....Feb., 1953
Your Lease .....Feb., 1953
Social Security, Farm.....Apr., 1953
Professional Farm Managers.Apr., 1953
U. S. Crop Predictions.....Apr., 1953
Lease, Human Side.....Apr., 1953

FARM EQUIPMENT and MACHINERY

Farming With LP Gas July,.1952
Portable Electric Motors ....July, 1952
Tractor Tire Tests .....Nov., 1952
Install Heat Lamps Safely ..Nov., 1952
When Power Fails .....Dec., 1952
New Stubble Gulper .....Dec., 1952
Let Machinery Work .....Dec., 1952
Winterproof Waterer .....Jan., 1953
Good Farm Wiring .....Mar., 1953
Electric Steam Accumulators Mar., 1953
Tractor Power Steering .....Mar., 1953
What Size Garden Tractor....Apr., 1953
Have Plenty of Water.....Apr., 1953

FEEDS

Too Much Sunshine .....July, 1952
Silage, Sulphur Dioxide Gas .July, 1952
Barn Yard Listening Post ..Sept., 1952
Report on Hay Crushers ....Sept., 1952
He Feeds Everything
That Grows .....Oct., 1952
Fitting Concentrates
to Roughage .....Nov., 1952
Feed Grass Silage .....Dec., 1952
Best Feed Buy .....Dec., 1952
How to Feed Poor Hay .....Jan., 1953
Urea, Protein Feed .....Mar., 1953
New Hormone .....Mar., 1953
Money From Roughages.....Apr., 1953

FERTILIZERS

Cornstalks Decrease Yields ..Sept., 1952
Topdressing Meadows
and Pastures .....Sept., 1952

Get Organic Matter Quick ...Oct., 1952
Build Fertility and Keep It ..Nov., 1952
Productive Fields .....Jan., 1953
Key to Fertility .....Feb., 1953
Report on Liquid Fertilizer .Feb., 1953
Antibiotic Fed Plants .....Mar., 1953

FORESTRY

Story of the Tree Farm .....Nov., 1952
Managed Wooldand .....Jan., 1953
FFA Grows Seedling Trees ..Jan., 1953
Woodlot Profit .....Mar., 1953
Don't Mistreat Trees.....Apr., 1953

FRUIT

Spraying Apples
for Less Money .....Sept., 1952
Check Rodent Damage .....Dec., 1952
Behold! The Lychee .....Jan., 1953
Concord Country .....Feb., 1953
Poison Ivy in Orchards .....Mar., 1953
New Apple Storage .....Mar., 1953
Ladino for Orchards.....Apr., 1953

HOGS

Hogs Need Less Protein .....July, 1952
Raise Every Pig .....July, 1952
New Antibiotic Pig Pellet ...Oct., 1952
Pastured Pork Costs Less ...Oct., 1952
Profit With Hogs .....Nov., 1952
Plan Pork Production .....Dec., 1952
Town of Ham .....Jan., 1953
Cheaper Hog Gains .....Jan., 1953
Swine Breeding Herd .....Feb., 1953
Remedies, Bloody Scours ....Feb., 1953
15 Years Sow Testing .....Feb., 1953
How Much Protein for Pigs .Mar., 1953

INSECTS and INSECTICIDES

Pest Control .....July, 1952
Weevil Meets Match .....Nov., 1952
Electrons Ride Bug Dust ....Nov., 1952
New Systemic Insecticides ...Feb., 1953
Automatic Cattle Sprayer ....Mar., 1953
Heptachlor Controls Ants ....Mar., 1953

PASTURES

Grass Cuts Milk Costs .....July, 1952
Plan for Pasture .....July, 1952
Ladino Can Take It .....Sept., 1952
Worth $100 an Acre .....Sept., 1952
Banded Fertilizers
for Legumes .....Oct., 1952
Irrigate Pastures .....Oct., 1952
Balbo Rye .....Oct., 1952
Cascade Lotus .....Oct., 1952
Rescuegrass .....Nov., 1952
Triple Pasture Profits .....Dec., 1952
Grass the Money Maker .....Jan., 1953
New Seed Treatment .....Jan., 1953
Why Pasture
Scored Excellent .....Jan., 1953
Managed Pasture .....Feb., 1953
Peel Old Pastures .....Mar., 1953
169 Cows on 37 Acres .....Mar., 1953
Legumes for Great Plains....Apr., 1953

POULTRY

Cut Broiler Costs .....July, 1952
Barnyard Goose .....July, 1952
Farm Assembly Line .....Sept., 1952
Gozzis' Turkeys Sell Retail ..Oct., 1952
Poultry Practices That Pay ..Oct., 1952
What's New in
Poultry Feeding .....Nov., 1952
How to Feed Layers .....Dec., 1952
Duckland U. S. A. .....Dec., 1952
Do Hatching Eggs Pay? .....Dec., 1952
Profits With Guineas .....Feb., 1953
Good Turkey Ranges .....Feb., 1953
New Way to Hatch .....Feb., 1953
How Hard to Cull .....Mar., 1953
Egg and Science .....Mar., 1953
Pole Type Poultry Houses....Apr., 1953
Give Chicks Fresh Air.....Apr., 1953

SHEEP and GOATS

Money in Sheep .....July, 1952
Two Lamb Crops a Year ....Sept., 1952
Breeding, Feeding for Wool .Oct., 1952
Feed Lambs Like Hogs .....Nov., 1952
Sheep Make a Profit .....Dec., 1952
Makes Money on Sheep .....Jan., 1953
Prussic Acid Poisoning .....Feb., 1953
Sheep, Too Much Work.....Apr., 1953
Spooner Sheep .....Apr., 1953

SOILS

Test Your Soil Vocabulary ...May, 1952
Soil Organic Matter .....July, 1952
Land Judging Contest .....Oct., 1952
New Nitrogen Soil Test .....Dec., 1952
Soil pH Explained .....Dec., 1952
Sweet Soil From Plain Dirt ..Dec., 1952
How to Handle Cornstalks ...Feb., 1953
Farm Drainage Problems ....Feb., 1953
Lime Is Plant Food.....Apr., 1953

VEGETABLES

Vegetable Growing Business .Nov., 1952

WEEDS

McGregor vs. Mesquite .....Nov., 1952
How Much for Weeds .....Nov., 1952
1953 Weed Control.....Apr., 1953

MISCELLANEOUS

Water Well Drilling .....July, 1952
Fishing in a Farm Pond .....July, 1952
Handling Manure .....July, 1952
Summer on Danish Farms ...Oct., 1952
Plenty of Honey .....Oct., 1952
Michigan's 4-H Fair .....Oct., 1952
People and Point Four .....Dec., 1952
Cloud Doctors Make Rain ....Jan., 1953
Profit in Ponies .....Jan., 1953
Aiding El Salvador .....Feb., 1953
Lincoln and Agriculture .....Feb., 1953
Crop Reporters .....Mar., 1953
Curing Pork on Farm .....Mar., 1953
Young Farmer's Day .....Mar., 1953
Dr. Sam Higginbotham.....Apr., 1953
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Fun and Fellowship.....Apr., 1953

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Farm Business Management— By Robertson and Woods. 1951. 546 pages, 248 illustrations. J. B. Lippincott. Prepared for use in all farm management and marketing courses. Combines the most up-to-date and authoritative content with the best farming practices available today in the field of farm management $3.80

The Hog Annual— Published by Farm Quarterly Magazine. March, 1952. Approximately 500 pages. First complete hog annual ever published. Contains names of all breed associations, secretaries, pig hatcheries, livestock yards, livestock commission salesmen, all of the hog farmers who sell over 400 hogs a year—fine articles on housing, sanitation, breeding and farrowing ... $5.00

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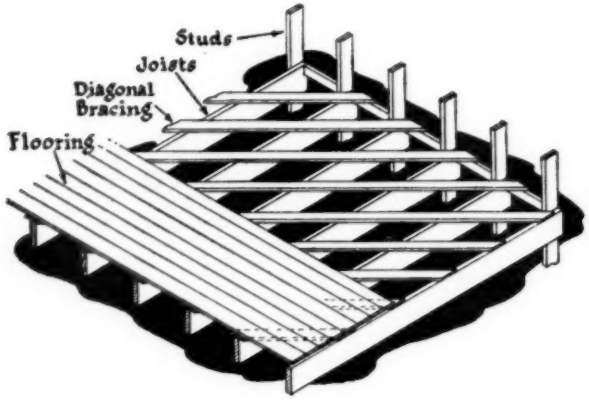

How to Keep Your Barn From Blowing Down

Keep your barn from blowing "in" and you can keep it from blowing "down," U.S.D.A. Forest Product Laboratory scientists report. They examined wind damaged barns and made tests to find that the sides of big barns first bowed in so much they came off their foundations before the barn collapsed. And they came to the conclusion that stiffening the mow floor is the best way to make a barn wind resistant.

With a million pound testing machine, they found a conventional barn floor bowed six inches with only a 4,000 pound pull. The same floor built with a partial sub-floor of one by six boards spaced about nine inches apart and nailed diagonally to the joists as illustrated above was 30 times stiffer. Under a 30,000 pound pull — equal to 100 mile wind — it bowed less than two inches.

Advantages of diagonal bracing, they explain, can be obtained in new or old barns by nailing heavier diagonals securely to the underside or top of existing mow rafters. Diagonals should be butted against the foundation sill plates and kingbeams and toenailed to them, as well as being spiked to the bottom of each joist.

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